975/5

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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

October 31, 1978

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

October 31, 1978 Volume 975 Number 5

CONTENTS

	Page
Patent and Trademark Notices	
Patent Cooperation Treaty Information	975 OG 40
Board of Appeals Decisions Rendered in the Month of September 1978	975 OG 40
Reissue Applications Filed	975 OG 40
Patent Notices	
Certificates of Correction for the Week of October 31, 1978	975 OG 42
Patents Available for Licensing or Sale	975 OG 42
National Technical Information Service	975 OG 43
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	975 OG 46
Condition of Patent Applications	975 OG 47
Reissue Patents Granted (29,816)	1703
Plant Patents Granted (4,326)	1705
Patents Granted	
General and Mechanical (4,122,552)	1707
Chemical (4,123,222)	1933
Electrical (4,123,617)	2047
Design Patents Granted (250,066)	2109
Index of Patentees	PI 1
Indices of Reissues, Plants and Designs	PI 43
Classification of	
Patents (Including Reissues)	PI 47
Designs and Plants	PI 50
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 51
Designs and Plants	PI 52
Change of Address Form and Subscription Order Form	Back Page

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
May 2, 1978. *Acting Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of September 1978

Affirmed	229
Affirmed in Part	25
Reversed	73
Total	327

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

D. 246,596, Re. S.N. 931,567, Filed Aug. 31, 1978, Cl. D23/19, COVER FOR SOLENOID OPERATED PILOT VALVE, Daniel H. Fialkowski, et al., Owner of Record: *Inventors,* Attorney or Agent: Paul F. Seibold, et al., Ex. Gp.: 290

3,097,488, Re. S.N. 935,084, Filed Aug. 18, 1978, Cl. 60/660, TURBINE CONTROL SYSTEM, Markus A. Eggenberger, et al., Owner of Record: *General Electric Company, Schenectady, N.Y.,* Attorney or Agent: John F. Ahern, et al., Ex. Gp.: 341

3,194,609, Re. S.N. 939,419, Filed Aug. 5, 1978, Cl. 305/57, SPROCKET AND CHAIN DRIVE, Lloyd Thurlow, Owner of Record: *Inventor,* Attorney or Agent: William A. Braddock, et al., Ex. Gp.: 311

3,632,538, Re. S.N. 937,677, Filed Aug. 28, 1978, Cl. 260/23 X, ORGANOTIN STABLIZER COMPOSITION CONTAINING MORE THAN 20% TIN AND RESIN COMPOSITIONS CONTAINING THE SAME, Otto Samuel Kauder, Owner of Record: *Argus Chemical Corporation, Brooklyn, N.Y.,* Attorney or Agent: John R. Janes, Ex. Gp.: 141

3,714,513, Re. S.N. 937,838, Filed Aug. 29, 1978, Cl. 361/415, PRINTED CIRCUIT CARD RETAINER AND RACK ASSEMBLY, Joseph Marconi, Owner of Record: *Inventor,* Attorney or Agent: Charles L. Gholz, Ex. Gp.: 217

3,808,178, Re. S.N. 931,355, Filed Aug. 7, 1978, Cl. 260/86, OXYGEN-PERMEABLE CONTACT LENS COMPOSITION METHOD AND ARTICLE OF MANUFACTURE, Norman G. Gaylord, Owner of Record: *Syntex (USA) Inc., Palo Alto, Calif.,* Attorney or Agent: Alan M. Krubiner, et al., Ex. Gp.: 144

3,809,844, Re. S.N. 930,647, Filed Jul. 31, 1978, Cl. 219/10.55, METHOD AND APPARATUS FOR TREATING HEAT-SENSITIVE PRODUCTS, Lennart Arvid Stenstrom, Owner of Record: *Alfa-Laval AB, Tumbia, Sweden,* Attorney or Agent: Cyrus S. Hapgood, et al., Ex. Gp.: 213

3,854,611, Re. S.N. 926,040, Filed Jul. 19, 1978, Cl. 214/302, METHOD AND APPARATUS FOR FEEDING CIGARETTES OR ANALOGOUS ARTICLES TO PACKING MACHINES OR THE LIKE, Gunter Wahle, Owner of Record: *Hauni-Werke Korber Co. KG, Hamburg, Germany,* Attorney or Agent: David S. Kane, et al., Ex. Gp.: 314

3,910,299, Re. S.N. 936,702, Filed Aug. 25, 1978, Cl. 137/13, TRANSPORTATION OF WAXY HYDROCARBON MIXTURE AS A SLURRY, James E. Tackett, et al., Owner of Record: *Marathon Oil Company, Findlay, Ohio,* Attorney or Agent: Joseph C. Herring, et al., Ex. Gp.: 241

3,935,466, Re. S.N. 940,156, Filed Sep. 5, 1978, Cl. 250/385, SMOKE DETECTOR ADAPTER TO A SMOKE SENSING APPARATUS, Yukio Tomioka, Owner of Record: *Hochiki Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Eric H. Waters, et al., Ex. Gp.: 256

3,960,845, Re. S.N. 893,813, Filed Apr. 19, 1978, Cl. 260/239.1, PROCESS FOR PREPARING 7 BETA-ACYLAMINO-7 ALPHA-ALKOXYCEPHALOSPORINS OR 6 BETA-ACYLAMINO-6 ALPHA-ALKOXYPENICILLINS, Tetsuo Hiraoaka, et al., Owner of Record: *Sankyo Company Ltd., Tokyo, Japan,* Attorney or Agent: Robert D. Flynn, et al., Ex. Gp.: 122

3,979,359, Re. S.N. 940,450, Filed Sep. 7, 1978, Cl. 260/45.75, CARBOFUNCTIONAL SULFUR AND CARBOXYLATE BRIDGED TIN COMPOUNDS, Thomas G. Kugele, et al., Owner of Record: *Cincinnati Milacron Chemicals, Inc., Reading, Ohio,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 141

3,981,774, Re. S.N. 938,589, Filed Aug. 31, 1978, Cl. 195/49, FERMENTATION OF OXYGENATED HYDROCARBON COMPOUNDS WITH THERMOPHILIC MICROORGANISMS, Donald O. Hitzman, Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 172

3,997,307, Re. S.N. 936,674, Filed Aug. 24, 1978, Cl. 65/6, METHOD AND APPARATUS FOR MAKING GLASS FIBERS UTILIZING AN OSCILLATING SPINNER, Duane Harold Faulkner, et al., Owner of Record: *Johns-Manville Corporation, Denver, Colo.,* Attorney or Agent: Robert M. Krone, et al., Ex. Gp.: 173

4,004,778, Re. S.N. 930,655, Filed Jul. 31, 1978, Cl. 254/142, PORTABLE ROOF WINCH, George J. Steinhagen, Owner of Record: *Inventor,* Attorney or Agent: A. C. Ross, et al., Ex. Gp.: 315

4,027,287, Re. S.N. 936,968, Filed Aug. 25, 1978, Cl. 364/900, STORAGE-CONTROLLED OUTPUT DEVICE, Gerhard Dirks, Owner of Record: *Hale Bros. Associates, Inc., San Francisco, Calif.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 237

4,033,746, Re. S.N. 922,124, Filed Jul. 5, 1978, Cl. 71/30, FOREST FERTILIZATION, Donald C. Young, et al., Owner of Record: *Union Oil Co., Los Angeles, Calif.,* Attorney or Agent: M. Howard Silverstein, et al., Ex. Gp.: 173

4,033,747, Re. S.N. 922,122, Filed Jul. 5, 1978, Cl. 71/30, SILVICULTURE FERTILIZATION, Donald Young, et al., Owner of Record: *one half to Union Oil Co., Los Angeles, Calif.; one half to the United States of America as represented by the Secretary of Agriculture,* Attorney or Agent: M. Howard Silverstein, et al., Ex. Gp.: 173

4,035,173, Re. S.N. 922,123, Filed Jul. 5, 1978, Cl. 71/30, SELECTIVELY THINNING AND FERTILIZING TIMBER FORESTS, Saburo Hashimoto, et al., Owner of

Record: *Union Oil Co., Los Angeles, Calif.*, Attorney or Agent: M. Howard Silverstein, et al., Ex. Gp.: 173

4,056,178, Re. S.N. 937,676, Filed Aug. 28, 1978, Cl. 192/58 B, MAGNETICALLY ACTUATED VISCOUS FLUID COUPLING, Rodney H. Detty, Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Robert J. McCloskey, et al., Ex. Gp.: 345

4,064,338, Re. S.N. 939,832, Filed Sep. 5, 1978, Cl. 526/230, METHOD FOR PREPARING BIOLOGICALLY ACTIVE COPOLYMERS OF TRIORGANOTIN ACRYLATES, David B. Russell, Owner of Record: *M & T Chemicals Inc., Greenwich, Conn.*, Attorney or Agent: Kenneth G. Wheeless, et al., Ex. Gp.: 144

4,092,081, Re. S.N. 938,241, Filed Aug. 30, 1978, Cl. 404/10, ROADWAY/TRAFFIC DELINEATOR, Donald W. Schmanski, Owner of Record: *Inventor,* Attorney or Agent: Vaugh W. North, et al., Ex. Gp.: 351

4,093,232, Re. S.N. 936,784, Filed Aug. 25, 1978, Cl. 273/121 A, PLAYER OPERATED GAME APPARATUS, David J. Nutting, et al., Owner of Record: *Bally Manufacturing Corporation, Chicago, Ill.*, Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 334

PATENT NOTICES

Certificates of Correction for the Week of Oct. 31, 1978

Re. 29,628	4,064,056	4,085,475	4,090,545
Re. 29,680	4,064,603	4,085,847	4,090,619
D. 247,818	4,066,597	4,085,975	4,090,817
D. 248,148	4,067,998	4,086,036	4,090,949
3,577,424	4,068,422	4,086,251	4,090,955
3,704,568	4,069,064	4,086,287	4,090,972
3,737,475	4,069,180	4,086,387	4,091,017
3,739,911	4,069,422	4,086,542	4,091,035
3,823,539	4,069,448	4,086,588	4,091,051
3,867,210	4,069,538	4,086,661	4,091,131
3,871,889	4,070,340	4,086,770	4,091,135
3,945,955	4,070,369	4,087,052	4,091,231
3,957,687	4,070,796	4,087,131	4,091,524
3,958,337	4,072,783	4,087,224	4,091,549
3,960,767	4,074,171	4,087,308	4,091,645
3,965,074	4,076,864	4,087,656	4,091,681
3,966,303	4,078,601	4,088,097	4,091,744
3,969,440	4,079,841	4,088,136	4,091,923
3,972,837	4,080,587	4,088,464	4,091,940
3,974,569	4,080,610	4,088,469	4,092,030
3,990,132	4,081,336	4,088,633	4,092,056
3,992,600	4,081,633	4,088,810	4,092,179
3,992,620	4,082,383	4,089,163	4,092,252
4,004,264	4,082,472	4,089,226	4,092,282
4,012,776	4,082,639	4,089,384	4,092,326
4,014,853	4,082,716	4,089,429	4,092,343
4,019,617	4,082,731	4,089,435	4,092,571
4,026,878	4,082,830	4,089,695	4,092,802
4,027,335	4,082,886	4,089,769	4,092,838
4,031,555	4,083,098	4,089,793	4,092,921
4,042,734	4,083,295	4,089,867	4,093,160
4,052,239	4,083,686	4,089,959	4,093,190
4,052,370	4,083,854	4,090,365	4,093,564
4,052,379	4,083,899	4,090,378	4,093,614
4,052,557	4,084,156	4,090,382	4,093,698
4,053,845	4,084,753	4,090,405	4,093,807
4,055,027	4,084,968	4,090,421	4,094,672
4,056,454	4,085,012	4,090,427	4,095,242
4,056,687	4,085,102	4,090,496	4,096,764
4,056,911	4,085,271	4,090,535	

Patents Available for Licensing or Sale

4,026,086. BUILDING BRICK. David Thomas Langley, Jr., 1809 Butts St., Georgetown, S.C. 29440.

4,065,640. APPARATUS FOR INTERCONNECTING A TELEPHONE LINE AND A PORTABLE CALCULATOR. Jeane Marie Rouiller, Convet, Switzerland. Correspondence to: Stevens, Davis, Miller & Mosher, P.O. Box 2627, Arlington, Va. 22202.

4,092,027. GOLD PRACTICE DEVICE. Lee T. Carter, 3400 Portola Drive, Sp. 11, Santa Cruz, Calif. 95062.

4,112,748. AUTOMATIC PORTABLE SOLID STATE VOLTAGE REGULATOR TESTER. Richard J. Walley, 6392 Marshall Ave., Buena Park, Calif. 90621.

The following two patents are offered by Philip Boone, 15 Fenwick Road, Winchester, Mass. 01890.

4,106,616. DEVICE FOR POSITIONING A CONTAINER OF SUPPLEMENTAL MATERIAL IN OPERATIONAL ALIGNMENT ADJACENT TO A TOILET-TISSUE HOLDER.

4,106,617. BATHROOM FIXTURE.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to Patent Counsel, Turbine Patent Operation, General Electric Company, 1 River Road, Building 18a–5th Floor, Schenectady, N.Y. 12345.

3,991,333. WINDING SUPPORT STRUCTURE FOR SUPERCONDUCTING ROTOR.

3,991,587. METHOD OF SUPPLYING CRYOGENIC FLUID THROUGH A TRANSFER JOINT EMPLOYING A STEPPED BAYONET RELATIVE MOTION GAP.

3,991,588. CRYOGENIC FLUID TRANSFER JOINT EMPLOYING A STEPPED BAYONET RELATIVE-MOTION GAP.

3,995,180. GENERATOR ROTOR OUTLETS FOR INCREASED VENTILATION.

4,018,059. CRYOGENIC FLUID TRANSFER JOINT EMPLOYING GASEOUS SEALS.

4,048,529. FLOW CONTROL DEVICE FOR SUPERCONDUCTIVE ROTOR REFRIGERANT.

4,054,809. STATOR CORE END MAGNETIC SHIELD FOR LARGE A.C. MACHINES.

4,089,653. APPARATUS FOR THE SEPARATION OF HYDROGEN SULFIDE FROM GAS MIXTURE INCLUDING CARBON DIOXIDE.

4,091,146. FLEXIBLE, LOW POROSITY AIRFOIL SKIN.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

3,812,314. HIGH POWER ELECTRICAL BUSHING HAVING A VACUUM SWITCH ENCAPSULATED THEREIN.

Application for license may be addressed to the General Electric Company, Division Patent Counsel, Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

D. 243,041. DESIGN FOR A LOOKING GLASS OR SIMILAR ARTICLE.

4,003,388. HAIR DRYER VARIABLE CONTROL.

4,088,869. DRYER TEMPERATURE LIMITER.

Gas Research Institute offers to grant nonexclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under these patents should be addressed to: Vice President, Operations, Gas Research Institute, 10 West 35th Street, Chicago, Ill. 60616, phone 312–567–6622.

3,055,209. METHOD FOR LOCATING LEAKS IN UNDERGROUND GAS CONDUITS.

3,120,589. SWITCH CONTROL APPARATUS, ESPECIALLY FOR GAS BURNER VALVES.

3,136,355. GAS IGNITION SYSTEM EMPLOYING PIEZOELECTRIC ELEMENT.

3,137,144. LEVEL CONTROL AND FAIL SAFE ARRANGEMENT FOR ABSORPTION REFRIGERATION SYSTEMS.

3,138,770. WAVE-COUPLING PLUG-IN APPARATUS FOR WAVE GUIDE COMMUNICATIONS THROUGH PRESSURIZED PIPE LINE.

3,142,332. GAS BURNER IGNITION SYSTEM.

3,142,782. TRANSISTOR SYSTEM FOR GAS IGNITION AND THE LIKE.

3,159,202. BURNER PILOT CONTROL MEANS.

3,164,445. GREASE VAPOR INCINERATOR.

3,170,631. HEAT AND PRESSURE SENSITIVE VALVE.

3,174,533. SPARK IGNITION SYSTEM FOR GAS BURNERS WITH IGNITION INDICATOR.

3,174,534. SPARK IGNITION SYSTEM FOR GAS BURNERS.

3,174,535. IGNITION SYSTEM FOR GAS BURNERS.

3,257,239. METHOD OF MAKING COMBINED FUEL CELL ELECTROLYE AND ELECTRODES.

3,264,864. APPARATUS FOR PINPOINTING LEAKS IN BURIED PIPES.

3,295,585. APPARATUS FOR SENSING THE COMPOSITION OF GASES, AND GAS BURNER SYSTEM EMPLOYING SAME.

3,306,596. HEATED-GAS SYSTEM WITH APPARATUS FOR REMOVING GAS-BORNE FOREIGN BODIES.

3,334,620. RADIANT OVEN.

3,347,647. CONVERSION OF SOLID FOSSIL FUELS TO HIGH-BTU PIPELINE GAS.

3,348,104. BIAS-CONTROLLED A.C.-OPERABLE VOLTAGE THRESHOLD CIRCUIT, AND SYSTEMS EMPLOYING SAME.

3,351,818. A.C.-OPERABLE VOLTAGE THRESHOLD CIRCUITS.

3,357,339. AUTOMATIC COFFEE MAKER.

3,375,081. GREASE INCINERATOR.

3,377,125. ELECTRICAL IGNITION SYSTEM FOR GASEOUS FUEL BURNERS AND THE LIKE.

3,384,068. GAS OVEN SYSTEM.

3,400,555. REFRIGERATION SYSTEM EMPLOYING HEAT ACTUATED COMPRESSOR.

3,402,704. GASEOUS FUEL ENGINE.

3,413,815. HEAT-ACTUATED REGENERATIVE COMPRESSOR FOR REGRIGERATING SYSTEMS.

3,421,868. FREE FALL SHALE HYDROGASIFICATION.

3,425,399. STRATIFIED CHARGE GAS ENGINE.

3,435,816. VENT ARRANGEMENT FOR SEALED COMBUSTION SYSTEMS.

3,437,085. SELF-CLEANING GAS OVEN SYSTEM AND GAS BURNER MEANS THEREFOR.

3,445,172. FAIL-SAFE SYSTEM.

3,458,445. ABSORPTION REFRIGERATION SYSTEM CONTAINING SOLUTIONS OF MONOETHYLAMINE WITH THIOCYANATES.

3,477,797. PROXIMITY-RESPONSIVE GAS BURNER IGNITER.

3,490,352. AIR BAFFLE APPARATUS.

3,507,725. PROCESS FOR REPAIRING GAS MAIN JOINTS.

3,526,285. ANGULARLY ADJUSTABLE AUGER HEAD.

3,527,199. GAS BURNER APPARATUS.

3,541,013. LITHIUM BROMIDE-LITHIUM THIOCYANATE-WATER COMPOSITION FOR AN ABSORBENT-REFRIGERATION SYSTEM.

3,554,301. OPTICAL AUGER GUIDANCE SYSTEM.

3,554,302. DIRECTIONAL CONTROL OF EARTH BORING APPARATUS.

3,556,917. HONEYCOMB INSULATION PANEL FOR CRYOGENIC TEMPERATURES.

3,559,724. COMFORT CONDITIONING SYSTEM.

3,587,756. GEODYNAMIC WING.

3,592,941. METHOD FOR PRODUCING ELECTRON FLOW IN CARBONATE ELECTROLYTE FUEL CELL.

3,609,087. SECONDARY ALCOHOL ADDITIVES FOR LITHIUM BROMIDE-WATER ABSORPTION REFRIGERATION SYSTEM.

3,621,665. THERMAL PUMP AND PROCESS.

3,621,666. COOLING APPARATUS AND PROCESS.

3,621,667. COOLING APPARATUS AND PROCESS.

3,677,026. INTERNAL COMBUSTION HEAT ENGINE AND PROCESS

3,677,027. INTERNAL COMBUSTION HEAT ENGINE AND PROCESS.

3,684,260. RADIATION REGENERATIVE BURNER.

3,690,113. GAS COOLING PROCESS AND APPARATUS.

3,703,886. PUMPLESS STRATIFIED CHARGE GAS ENGINE.

3,741,227. FLUID PRESSURE REGENERATOR AND PROCESS.

3,746,504. RADIANT GAS BURNER DEVICE FOR HEATING.

3,842,864. STOPPING APPARATUS FOR PIPE LINES.

3,865,070. DEVICE AND METHOD FOR CONVERTING HEAT FROM FUEL INTO VISIBLE LIGHT WITH CHANGEABLE COLORS.

3,891,403. OIL SHALE HYDROGASIFICATION PROCESS.

3,891,404. HEAVY OIL HYDROGASIFICATION PROCESS.

3,907,980. THERMO-ELECTROCHEMICAL PROCESS FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER.

3,922,215. PROCESS FOR PRODUCTION OF HYDROCARBON LIQUIDS AND GASES FROM OIL SHALE.

3,929,615. PRODUCTION OF HYDROCARBON GASES FROM OIL SHALE.

3,939,257. PROCESS FOR PRODUCING HYDROGEN FROM WATER.

3,953,575. IRON OXIDE SORBENTS FOR REGENERATIVE SORPTION OF NO_x.

3,973,056. INHIBITION OF STRESS-CORROSION CRACKING OF STEEL PIPELINE.

3,998,942. PROCESS FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER.

4,003,821. PROCESS FOR PRODUCTION OF HYDROCARBON LIQUID FROM OIL SHALE.

4,009,321. HIGH TEMPERATURE FUEL CELL ELECTROLYTE.

4,075,313. PROCESS FOR PRODUCING HYDROGEN AND OXYGEN FROM WATER.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 700,467. Bag for Storing Whole Blood. Filed June 26, 1976.

Patent application 730,468. Surfactant-Assisted Liquefaction of Particulate Carbonaceous Substances. Filed Oct. 7, 1976.

Patent application 741,749. Coupling Apparatus for Ultrasonic Medical Diagnostic System. Filed Nov. 15, 1976.

Patent application 814,384. Process for Manufacturing Cannula. Filed July 11, 1977.

Patent application 848,428. Formulated Plastic Separators for Soluble Electrode Cells. Filed Nov. 3, 1977.

Patent application 858,761. High Temperature Resistant Cermet and Ceramic Compositions. Filed Dec. 8, 1977.

Patent application 858,766. High Temperature Resistant Cermet and Ceramic Compositions. Filed Dec. 8, 1977.

Patent application 861,389. High Visibility Air Sea Rescue Panel. Filed Dec. 16, 1977.

Patent application 863,770. Method for Fabricating Solar Cells Having Integral Collector Grids. Filed Dec. 23, 1977.

Patent application 891,246. Soft X-ray Laser Using Crystal Channels as Distributed Feedback Cavities. Filed Mar. 28, 1978.

Patent application 891,358. A Solar Array Strip and a Method for Forming the Same. Filed Mar. 29, 1978.

Patent application 899,123. Improved Back Wall Cell. Filed Apr. 24, 1978.

Patent application 900,841. Secure Communication System. Filed Apr. 28, 1978.

Patent application 901,892. Cesium Thermionic Converter Having Improved Electrodes. Filed May 1, 1978.

Patent application 906,297. Low Cost Solar Energy Collection System. Filed May 15, 1978.

Patent application 907,421. Power Control for Hot Gas Engines. Filed May 19, 1978.

Patent application 907,431. Hot Gas Engine With Dual Crankshafts. Filed May 19, 1978.

Patent application 907,435. Heat Resistant Polymers of Oxidized Styrylphosphine. Filed May 19, 1978.

Patent application 907,479. Heat Resistant Polymers of Oxidized Styrylphosphine. Filed May 19, 1978.

Patent application 909,100. Toggle Mechanism for Pinching Metal Tubes. Filed May 19, 1978.

Patent application 910,707. Satellite Personal Communications System. Filed May 30, 1978.

Patent application 910,709. A Tool for Use in Joining Connectors to Shielded Cables. Filed May 30, 1978.

Patent application 910,793. Stainless Steel Panel for Selective Absorption of Solar Energy and the Method of Producing Said Panel. Filed May 30, 1978.

Patent application 911,747. Ceramic Fiber Insulating Material and Method of Producing Same. Filed June 11, 1978.

Patent application 914,260. Electrochemical Cell for Rebalancing REDOX Flow System. Filed June 9, 1978.

Patent application 915,050. Solar Cell System Having Alternating Current Output. Filed June 9, 1978.

Patent 4,077,231. Multistation Refrigeration System. Filed Aug. 9, 1976. Patented Mar. 7, 1978. Not available NTIS.

Patent 4,078,110. Flexible Pile Thermal Barrier Insulator. Filed Apr. 28, 1976. Patented Mar. 7, 1978. Not available NTIS.

Patent 4,082,569. Solar Cell Collector. Filed Feb. 22, 1977. Patented Apr. 4, 1978. Not available NTIS.

Patent 4,083,097. Method of Making Encapsulated Solar Cell Modules. Filed Nov. 30, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,083,380. Fluid Valve Assembly. Filed May 27, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,083,765. Polymeric Electrolytic Hygrometer. Filed Dec. 21, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,084,124. Method and Apparatus for Conditioning of Nickel-Cadmium Batteries. Filed Nov. 24, 1976. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,084,612. Flow Compensating Pressure Regulator. Filed Mar. 21, 1977. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,084,985. Method for Producing Solar Energy Panels by Automation. Filed Apr. 25, 1977. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,085,241. Inorganic–Organic Separators for Alkaline Batteries. Filed Sept. 7, 1976. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,085,332. Apparatus for Extraction and Separation of Preferentially Photo-Dissociated Molecular Isotope into Positive and Negative Ions by Means of an Electric Field Filed June 3, 1976. Patented Apr. 18, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE ARMY

Office of Judge Advocate General
Patent Division, Room 2–C455, Pentagon
Washington, D.C. 20310

Patent 3,016,369. Organotin Acrylic Polymers. Filed July 16, 1958. Patented January 9, 1962.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, Washington, D.C. 20314

Patent 3,985,321. Automatic Line Release System. Filed Nov. 25, 1975. Patented Oct. 12, 1976.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent 3,904,293. Optical Method for Surface Texture Measurement. Filed Dec. 6, 1973. Patented Sept. 9, 1975.

Patent 3,950,617. Helium Speech Unscrambler With Pitch Synchronization. Filed Sept. 9, 1974. Patented Apr. 13, 1976.

Patent 3,959,739. Electro-Optic Tuning of Organic Dye Laser. Filed Feb. 3, 1975. Patented May 25, 1976.

Patent 3,962,639. System for Reducing Radio Communication Frequency Bandwidth and Increasing Number of Channels Available. Filed June 11, 1973. Patented June 8, 1976.

Patent 3,972,755. Dielectric Circuit Board Bonding. Filed Oct. 29, 1974. Patented Aug. 3, 1976.

Patent 3,975,865. Fiber Optic Grinding and Polishing Tool. Filed May 27, 1975. Patented Aug. 24, 1976.

Patent 3,976,873. Tunable Electroabsorptive Detector. Filed May 8, 1975. Patented Aug. 24, 1976.

Patent 3,976,882. Invisible Radiation Imaging Device. Filed June 23, 1975. Patented Aug. 24, 1976.

Patent 3,976,976. Method and Means to Access an Extended Memory Unit. Filed Apr. 4, 1975. Patented Aug. 24, 1976.

Patent 3,977,788. Interferometer Stabilizer. Filed Sept. 4, 1975. Patented Aug. 31, 1976.

Patent 3,978,444. Seafloor Mapping System. Filed May 30, 1975. Patented Aug. 31, 1976.

Patent 3,980,395. Liquid Crystal Switch for Optical Waveguide. Filed Dec. 2, 1974. Patented Sept. 14, 1976.

Patent 3,981,810. Grease Composition. Filed Nov. 11, 1975. Patented Sept. 21, 1976.

Patent 3,988,670. Automatic Testing of Digital Logic Systems. Filed Apr. 15, 1975. Patented Oct. 26, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 3,988,561. Weld-Bonded Titanium Structures. Patented Oct. 26, 1976.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General
Services Division, Federal Bldg., Agricultural Research
Service, Hyattsville, Md. 20782

Patent 3,958,452. Uniform Planar Strain Tester. Filed Jan. 23, 1975. Patented May 25, 1976.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research—
Code 302, Arlington, Va. 22217

Patent 3,898,048. Light-Weight Rocket Deployable Gas Generator. Filed Mar. 21, 1974. Patented Aug. 5, 1975.

Patent 3,903,496. Opto-Acoustic Hydrophone. Filed June 14, 1974. Patented Sept. 2, 1975.

Patent 3,903,497. Opto-Acoustic Hydrophone. Filed June 14, 1974. Patented Sept. 2, 1975.

Patent 3,940,732. Buoyant Electrode and System for High Speed Towing. Filed Mar. 30, 1970. Patented Sept. 24, 1976.

Patent 3,943,482. Marine Mine Detector. Filed Oct. 3, 1967. Patented Mar. 9, 1976.

Patent 3,949,676. Load Actuated Electro-Ignition Circuit Switch. Filed June 10, 1974. Patented Apr. 13, 1976.

Patent 3,953,828. High Power-Wide Frequency Band Electro-Acoustic Transducer. Filed Nov. 8, 1968. Patented Apr. 27, 1976.

Patent 3,958,490. Self-Cocking Rocket Launcher Detent. Filed Dec. 19, 1974. Patented May 25, 1976.

Patent 3,960,171. Helmet Exhaust Valve. Filed Jan. 27, 1975. Patented June 1, 1976.

Patent 3,961,476. Metal Interlayer Adhesive Technique. Filed Sept. 11, 1975. Patented June 8, 1976.

Patent 3,961,555. Safety Mechanism for Intervalometers and Distributors. Filed Jan. 13, 1975. Patented June 8, 1976.

Patent 3,962,628. Adjustable Magnetic Gradiometer. Filed Apr. 14, 1975. Patented June 8, 1976.

Patent 3,968,445. Digital Pulse Width Doubler. Filed Apr. 29, 1974. Patented July 6, 1976.

Patent 3,968,723. Method for Reclaiming and Recycling Plastic Bonded Energetic Material. Filed Mar. 3, 1975. Patented July 13, 1976.

Patent 3,968,751. Arming Device. Filed Sept. 5, 1975. Patented July 13, 1976.

Patent 3,969,263. Method of Producing Light Using Catalyst Chemiluminescent System. Filed Mar. 3, 1975. Patented July 13, 1976.

Patent 3,969,676. Electron Beam Ionization Signal Sampler. Filed Apr. 17, 1975. Patented July 13, 1976.

Patent 3,974,985. Wide Angle Seeker. Filed May 18, 1972. Patented Aug. 17, 1976.

Patent 3,974,990. Dual Ejector Stores Attitude Control System. Filed July 21, 1975. Patented Aug. 17, 1976.

Patent 3,977,003. Conformal Helmet Antenna. Filed Oct. 15, 1974.Patented Aug. 24, 1976.

Patent 3,977,004. Aircraft VLF/LF/MF Window Antenna Receiving System. Filed June 16, 1975. Patented Aug. 24, 1976.

Patent 3,978,430. Segmented Flow Laser Cavity. Filed Oct. 2, 1975. Patented Aug. 31, 1976.

Patent 3,978,894. Energy Absorbing Tear-Webbing. Filed Feb. 5, 1973. Patented Sept. 7, 1976.

Patent 3,982,144. Directional Low-Frequency Ring Hydrophone. Filed Aug. 23, 1974. Patented Sept. 21, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 3,983,695. Ion Beam Thruster Shield. Patented Oct. 5, 1976.

Patent 3,983,780. Casting Propellant in Rocket Engine. Patented Oct. 5, 1976.

Patent 3,984,072. Attitude Control System. Patented Oct. 5, 1976.

Patent 3,984,730. Method and Apparatus for Neutralizing Potentials Induced on Spacecraft Surfaces. Patented Oct. 5, 1976.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General
Services Division, Federal Bldg., Agricultural Research
Service, Hyattsville, Md. 20782

Patent 3,948,733. Simplified Protein Hydrolysis Apparatus. Filed Dec. 12, 1973. Patented Apr. 6, 1976.

Patent 3,949,515. In-Field Boll Weevil Trap. Filed July 23, 1975. Patented Apr. 13, 1976.

Patent 3,954,866. Process for the Preparation of Quaternary Arylaminoalkyl Phosphonium Salts. Filed Dec. 5, 1974. Patented May 4, 1976.

Patent 3,960,763. Agricultural Foams as Carriers for Activated Charcoal. Filed July 17, 1974. Patented June 1, 1976.

Patent 3,976,320. Chicken Coop Lifting Device. Filed Aug. 14, 1975. Patented Aug. 24, 1976.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent 3,744,739. Multpile In-Line Docking Capability for Rotating Space Station. Patented July 10, 1973.

Patent 3,982,810. Hydrogen-Rich Gas Generator. Patented Sept. 28, 1976.

Patent 3,983,714. Cryostat System for Temperatures on the Order of 2 Deg K or Less. Patented Oct. 5, 1976.

Patent 3,983,749. Annular Arc Accelerator Shock Tube. Patented Oct. 5, 1976.

Patent 3,983,753. Thermistor Hokder for Skin Temperature Measurements. Patented Oct. 5, 1976.

Patent 3,983,933. Heat Exchanger. Patented Oct. 5, 1976.

Patent 3,984,070. Wingtip Vortex Dissipator for Aircraft. Patented Oct. 5, 1976.

Patent 3,984,256. Photovoltaic Cell Array. Patented Oct. 5, 1976.

Patent 3,984,634. Anti-Multipath Digital Signal Detector. Patented Oct. 5, 1976.

Patent 3,984,671. Optical Process for Producing Classification Maps From Multispectral Data. Patented Oct. 5, 1976.

Patent 3,984,681. Ion and Electron Detector for Use in an ICR Spectrometer. Patented Oct. 5, 1976.

Patent 3,984,685. Wind Measurement System. Patented Oct. 5, 1976.

Patent 3,984,686. Focused Laser Doppler Velocimeter. Patened Oct. 5, 1976.

Patent 3,984,799. The DC-to-DC Converters Employing Staggered-Phase Power Switches With Two-Loop Control Patented Oct. 5, 1976.

Patent 3,985,454. Window Defect Planar Mapping Technique. Patented Oct. 12, 1976.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 30, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	11-4-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-5-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	10-3-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	9-23-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-6-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-19-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	4-3-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-3-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-1-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	12-1-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-25-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	8-8-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-24-77

Expiration of patents: The patents within the range of numbers indicated below expire during September 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,998,606 to 3,002,191, inclusive
Plant Patents..... Numbers 2,085 to 2,094, inclusive

REISSUE PATENTS

GRANTED OCT. 31, 1978

ERRATA

For CLASS	See PATENT NO.
227–067	29,819

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,816

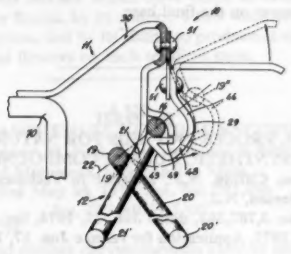
LOCKABLE HINGE STRUCTURE

Robert B. Winsor, Senneville, and George Thomson, Pierrefonds, both of Canada, assignors to IEC-Holden Ltd., Montreal, Canada

Original No. 3,987,516, dated Oct. 26, 1976, Ser. No. 628,897, Nov. 5, 1975. Application for reissue Nov. 21, 1977, Ser. No. 853,508

Int. Cl.[2] E05D *11/10*

U.S. Cl. 16—143 **14 Claims**



1. A lock hinge comprising a latch bracket and a base bracket; said base bracket having a pivot bar; said latch bracket having a saddle member defining a hinge seat with a mouth opening for receiving at least a portion of said pivot bar therein; a latch member having a lever end and a gate end; said latch member being interconnected to said saddle member by a flexible plate which is secured adjacent one end to said saddle member and adjacent an opposed end to said latch member, said gate end being displaceably held adjacent said mouth opening of said hinge seat by said flexible plate to retain said pivot bar captive in said hinge seat to interconnect said latch bracket to said base bracket, said gate end being displaceable away from adjacent said hinge seat mouth opening by [pulling] *displacing* said lever end in a predetermined direction against the spring load exerted by said [leaf] *flexible plate.*

Re. 29,817

DENTAL PIN

Nathaniel H. Lieb, Narberth, and Richard A. Wallace, Audubon, both of Pa., assignors to Star Dental Manufacturing Co. Inc., Conshohocken, Pa.

Original No. 3,861,043, dated Jan. 21, 1975, Ser. No. 350,235, Apr. 11, 1973. Application for reissue Jan. 12, 1977, Ser. No. 758,873

Int. Cl.[2] A61K *5/02*

U.S. Cl. 32—15 **11 Claims**

1. A dental pin comprising a shaft, a thread formed of said shaft, said thread having an arcuate outer edge, said shaft having a lower end, and means for tapping a thread in a tooth on said shaft, said tapping means comprising a cutting face on said thread, said cutting face being formed as the leading edge of said thread, said cutting face being formed at the lower end of said shaft, said shaft having a flute formed on the bottom thereof, said thread terminating at said flute, and said cutting face comprising the leading edge of said thread adjacent said flute.

Re. 29,818

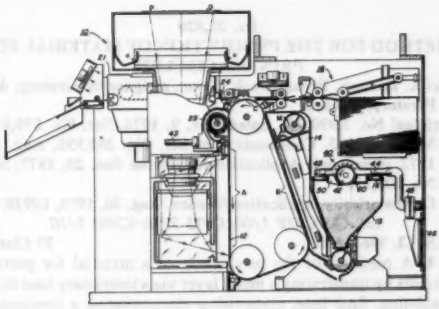
TONER-RECLAIMING SYSTEM

Dennis P. Gerbasi, West Webster, and James M. Donohue, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 3,641,979, dated Feb. 15, 1972, Ser. No. 847,861, Aug. 6, 1969. Application for reissue Feb. 28, 1977, Ser. No. 772,414

Int. Cl.[2] G03G *13/00*

U.S. Cl. 118—652 **2 Claims**



4. A particle reclaiming system for use in a machine having a working zone to which particles are supplied in excess of quantities needed and from where some of the excess particles are removed therefrom including,

a collecting surface adapted for movement through first and second spaces,

means for receiving the particles to be removed and for conveying the same into said first space for contacting said surface,

means for electrically charging the particles while in said first space for impressing an electrostatic charge thereon different from the electrostatic charge on said surface to which charged particles are attracted and adhere during movement thereof,

means contacting said collecting surface and adapted to wipe the particles from the surface, and

means for returning the removed particles to the working zone for reuse therein.

Re. 29,819
FASTENER ATTACHMENT SYSTEM NEEDLE CONSTRUCTIONS

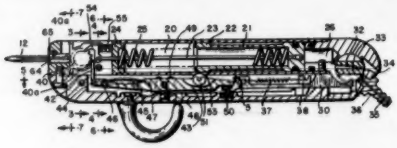
Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original No. 3,895,753, dated Jul. 22, 1975, Ser. No. 382,963, Jul. 26, 1973. Continuation of Ser. No. 158,438, Jun. 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 39,564, Apr. 17, 1970, Pat. No. 3,659,769. Application for reissue Jul. 22, 1977, Ser. No. 817,944

The portion of the term of this patent subsequent to Apr. 25, 1989, has been disclaimed.

Int. Cl.[2] **B65C** *7/00*

U.S. Cl. 227—67 **30 Claims**



26. A needle for dispensing attachments comprising

a body having a mounting tubular portion which is proportioned for the removable insertion of the needle into a dispensing device,

said needle including a central bore extending through said body and

an elongated slot communicating with said central bore and extending along said body,

said needle being provided with a cutting edge at least over a part of its mounting portion,

whereby the removability of said needle permits a worn needle and a dull point to be removed from the dispensing device and replaced by a substitute needle with a sharp point.

Re. 29,820
METHOD FOR THE PRODUCTION OF MATERIAL FOR PRINTED CIRCUITS

Jiri K. Konicek, Broad Brook, Conn., assignor to Perstorp, AB, Perstorp, Sweden

Original No. 3,990,926, dated Nov. 9, 1976, Ser. No. 579,911, May 22, 1975. Continuation of Ser. No. 283,955, Aug. 28, 1972, abandoned. Application for reissue Jun. 20, 1977, Ser. No. 808,331

Claims priority, application Sweden, Aug. 30, 1971, 10929/71

Int. Cl.[2] **C23F** *1/00;* **C09J** *5/06;* **C25D** *5/10*

U.S. Cl. 156—630 **27 Claims**

1. A method for the production of a material for printed circuits by transferring a metal layer via a temporary base to an insulating, final base, comprising electroplating a continuous layer of copper or a copper alloy to a temporary base of a throw-away type, in the form of a foil of aluminum or alloy thereof [have] *having* a thickness less than 200μm, electroplating copper or a copper alloy for at least one further step to form at least one further layer by changing at least one of the plating variables of current density and composition of the electroplating bath of the first step to improve the adhesion to the final base, said electroplated layers having a combined thickness of 1–17 μm measured by weight, placing at least one side of a material consisting of partially cured fiber reinforced thermosetting plastic towards such electroplated layers of copper or copper alloy of such a temporary base, laminating under heat and pressure to cure said plastic thereby forming the final base and bringing about an adhesion between the electroplated layers and the final base amounting to at least 6 lbs/in and removing the temporary base in connection with the printed circuit manufacturing by etching, stripping, tearing off or a combination thereof, leaving the thin, electroplated metal layers on the final base.

Re. 29,821
NOVEL PROCESSING AIDS FOR NATURAL AND SYNTHETIC RUBBER COMPOUNDS

Erwin Aron, Clifton, N.J., assignor to Technical Processing, Inc., Paterson, N.J.

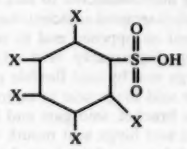
Original No. 3,787,341, dated Jan. 22, 1974, Ser. No. 263,752, Jun. 12, 1972. Application for reissue Jun. 17, 1975, Ser. No. 587,652

Int. Cl.[2] **C08L** *91/00*

U.S. Cl. 260—23.7 M **6 Claims**

5. A composition [according to claim 1 to which is added] *of matter comprising:*

a. an alkali salt of an aromatic sulfonic acid having the formula



wherein x is hydrogen or branched or straight chain alkyl group having from 4 to 14 carbon atoms;

b. a long chain fatty organic acid having a maximum of about 22 carbon atoms in the chain wherein the weight ratio of said fatty acid to said sulfonic acid is from 1:1 to 8.33:1; and

c. additional materials including aromatic esters, compounds with alcoholic and glycolic hydroxyl groups, potassium or sodium soaps of fats or fatty acids, a fatty acid, a metal soap of zinc, magnesium, calcium or barium, and a paraffin.

PLANT PATENTS

GRANTED OCTOBER 31, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,326

CHRYSANTHEMUM PLANT NAMED PARLIAMENT

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 16, 1977, Ser. No. 797,381
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, distinguished by its medium sized daisy-form blooms which have three to four rows of purple-pink ray florets, by its uniform 8 to 9 week year around flowering response, and by its ability to produce as many as 13 fully developed flowers on each terminal stem.

4,327

CHRYSANTHEMUM NAMED MINNGOPHER

Richard E. Widmer, St. Paul, Minn., assignor to Regents of The University of Minnesota, Minneapolis, Minn.

Filed May 16, 1977, Ser. No. 797,496
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by the dark red color of its medium sized blooms of decorative form displayed in an open spray formation on a short compact plant particularly suited for greenhouse pot plant culture and for outdoor garden growth.

4,328

CHRYSANTHEMUM NAMED BUCKEYE

Leonard H. Shoesmith, Westfield-Woking, England, assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 17, 1977, Ser. No. 798,088
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. The new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by its large sized blooms of single flower form with dark red ray florets and yellow disc florets, by its excellent performance as a natural season garden chrysanthemum and as a spring, summer and fall potted plant, and by its uniform 7-week photoperiodic flowering response for greenhouse pot plant culture.

4,329

GRAPEVINE

Toru Kitahara, 86600 Avenue 72, Thermal, Calif. 92274

Filed Dec. 23, 1977, Ser. No. 863,852
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine characterized by its similarity to the Perlette grapevine, which it most nearly resembles, but distinguished therefrom by bearing grapes which ripen approximately 10 days later, are elongated and somewhat pear shaped, and are harder and crisper than the grapes of either the Perlette or the Thompson Seedless.

PLANT PATENTS

PATENTS

GRANTED OCT. 31, 1978

ERRATA

For CLASS	See PATENT NO.
128–134	4,122,587
123–200	4,122,669
405–261	4,122,681
405–150	4,122,682
405–142	4,122,683
085–030	4,122,752
273–001 E	4,123,050
273–001 R	4,123,051
400–328	4,123,182
432–001	4,123,219
422–059	4,123,224
422–098	4,123,225
422–274	4,123,228
422–199	4,123,229
096–029	4,123,330
526–024	4,123,396
528–127	4,123,420
528–065	4,123,421
528–273	4,123,422
528–071	4,123,423
528–337	4,123,424
562–503	4,123,456
562–466	4,123,457
562–595	4,123,458
562–595	4,123,459
353–026 R	4,123,699

PATENTS

GRANTED OCTOBER 31, 1978

GENERAL AND MECHANICAL

4,122,552

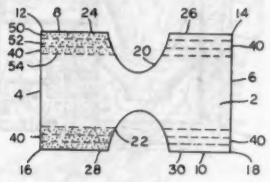
DISPOSABLE UNDERGARMENTS

Fred Tedford, 2291 23rd St., Los Angeles, Calif. 90018

Filed Nov. 7, 1977, Ser. No. 848,812

Int. Cl.[2] A41B *9/00*

U.S. Cl. 2—78 R **6 Claims**



1. A disposable one-piece undergarment comprising a sheet of flexible light weight material having first and second edges parallel to each other and third and fourth edges parallel to each other and normal to and contiguous with said first and second edges, a first recess extending inwardly of said third edge and being generally parabolically shaped, a second recess extending inwardly of said fourth edge and being generally parabolically shaped and positioned complementarily to said first recess, said first recess dividing said third edge into fifth and sixth edge portions and said second recess dividing said fourth edge into seventh and eighth edge portions, each of said fifth, sixth, seventh, and eighth portions being provided with a band of connecting material extending from the respective first or second edge to the respective recess, each said band of connecting material having a plurality of narrower bands of strip-away material side-by-side thereon, whereby said fifth and sixth edge portions may be joined together by selective removal of said strip-away bands, and said seventh and eighth edge portions may be joined together by selective removal of said strip-away bands, thereby to provide said garment with a size desired.

4,122,553

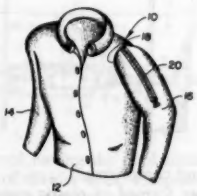
CONVERTIBLE JACKET/VEST GARMENT

Alan R. Pitkanen, 3120 Ocean Dr., Manhattan Beach, Calif. 90266

Filed Apr. 29, 1977, Ser. No. 792,201

Int. Cl.[2] A41D *1/04*

U.S. Cl. 2—102 **3 Claims**



1. A garment having a first portion for covering the upper torso of a wearer and having arm holes in the sides of the first portion for receiving the arms of the wearer; a pair of sleeves attached to said first portion of the garment by respective shoulder seams which extend around said arm holes, each of said sleeves extending from the corresponding shoulder seam to the wrist of the wearer and each of said sleeves having a longitudinal linear slit therein extending down the outside of such sleeve from a point adjacent to the corresponding shoulder seam a predetermined distance along such sleeve to a point adjacent to the elbow of such sleeve; said slit having a selected length such that it may be opened to an opening corresponding in size to the corresponding arm hole in the side of said first portion of the garment; and a linear closure means attached to each of the sleeves for selectively opening and closing the corresponding slit.

4,122,554

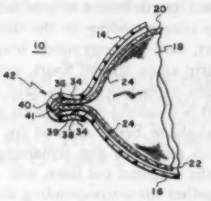
DISPOSABLE COSMETIC GLOVE

Phyllis H. Stager, 7619 Chattington, Dallas, Tex. 75240

Filed Mar. 28, 1977, Ser. No. 782,004

Int. Cl.[2] A41D *19/02*

U.S. Cl. 2—164 **2 Claims**



1. A disposable cosmetic glove comprising, in combination, an outer glove shell characterized by superposed first and second layers of lotion impervious material, an inner glove lining disposed in nesting relation within the shell intermediate the first and second impervious layers, the lining being characterized by superposed first and second lotion absorbent layers, the shell and lining layers being sealed together along the marginal edge of the glove thereby defining a central hand receiving chamber; the lotion impervious layers being formed of thermoplastic material and the lotion absorbent layers being formed of fiber material, one of the thermoplastic layers being folded around the superposed marginal edge portions of the fiber layers and overlapping the other thermoplastic layer, the combination further including an adhesive deposit bonding the fiber layer edge portions to the thermoplastic edge portions, the overlapping thermoplastic edge portions being thermally fused together.

4,122,555

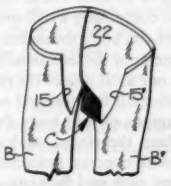
PANTY HOSE WITH CROTCH INSERT AND METHOD

Sam C. Safrit, Pfafftown; Kelly W. James, Creedmoor, and Roger D. Bullock, Stem, all of N.C., assignors to Alamance Industries, Inc., Burlington, N.C.

Filed Jun. 27, 1977, Ser. No. 810,524

Int. Cl.[2] A41B *9/04*

U.S. Cl. 2—401 **7 Claims**



1. A lower body garment comprising
(a) a pair of seamless knit legs,
(b) a panty portion formed of extensions integrally knit with said legs, said extensions being longitudinally slit and seamed together, and

(c) a separate single ply crotch insert of warp knit material of generally diamond-shaped configuration with pointed ends and first and second pairs of parallel side edges, said knitted crotch insert including wales extending parallel to said first pair of side edges, and courses extending perpendicular to the wales, said first pair of side edges comprising selvage edges, and said second pair of side edges comprising cut edges, and

(d) seam means connecting said first and second pairs of side edges to the slit edges of said extensions so that the crotch insert is positioned on the bias in the crotch portion of the panty.

3. A method of forming a lower body garment from a pair of seamless tubular blanks, the garment including a panty portion and a pair of legs, said method comprising the steps of

(a) longitudinally slitting each of the seamless tubular blanks from one end and inwardly a predetermined distance,

(b) forming a crotch insert for said garment by severing a predetermined length from a strip of fabric having a width substantially corresponding to the desired width of the crotch insert, said predetermined length being severed from said strip along spaced apart, substantially parallel, diagonal lines extending across said strip so that said crotch insert is diamond-shaped with two of the sides of the diamond-shape being defined by the opposite side edges of said strip and the remaining two sides being defined by the diagonal cut lines, and

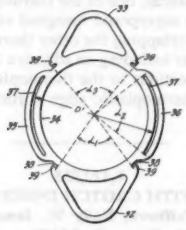
(c) sewing together the corresponding slit edges of the pair of tubular blanks while sewing the diamond-shaped crotch insert to the pair of tubular blanks between the slit edges and adjacent the ends of the slits.

4,122,556

INTRA-OCULAR LENS

Stanley Poler, 78 E. Second St., New York, N.Y. 10003

Filed Mar. 23, 1977, Ser. No. 780,445
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 32 Claims



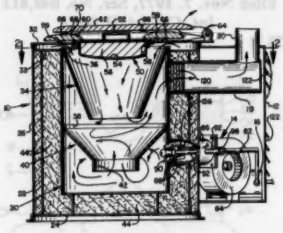
10. As an article of manufacture, a single unitary flexibly compliant mounting-adapter element having capability of assembly to another such mounting-adapter element for iris-stabilized mounting of an intra-ocular lens element of circular peripheral contour, comprising a circumferentially continuous centrally open inner-rim body formation of inner diameter less than the outer diameter of the lens element and for axial-retaining abutment with one axial side of the rim of the lens element, a pair of lens-positioning feet integral with diametrically opposed quadrant regions of said body formation and radially outwardly extending therefrom, and foot-engaging means integrally formed with opposed remaining quadrant regions of said body formation, each said foot-engaging means being at a radius greater than such lens-element outer radius and including means having interlocking engagement with one lens-positioning foot of another such mounting-adapter element when the latter is assembled to the other axial side of the lens element and when lens-positioning feet of the two such mounting-adapter elements are in quadrant-staggered interlace.

4,122,557

INCINERATOR

Frank N. Harris, 7700 SW. 69th Ave., Portland, Oreg. 97223

Filed Jul. 29, 1977, Ser. No. 820,347
Int. Cl.[2] A47K *11/02*
U.S. Cl. 4—111.3 12 Claims



1. In an incinerator,

a cylindrical, heat insulated bowl,

a tapered baffle in the bowl above the bottom of the bowl,

fuel injecting means for injecting fuel into the bowl below the baffle,

blower means for injecting air into the fuel,

means for igniting the fuel and air below the baffle,

and exhaust means for exhausting products of combustion,

the blower means including a tubular outlet directed substantially tangentially into the bowl,

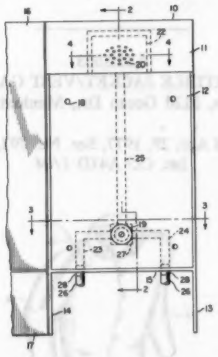
the fuel injecting means including a nozzle coaxial with the tubular outlet of the blower means.

4,122,558

WATER SHOWER UNIT

Menno Di Liberto, 45 Canterbury Dr., Athens, Ohio 47501, and Joseph P. Parisi, 87-60 97th St., Woodhaven, N.Y. 11421

Filed Dec. 23, 1976, Ser. No. 753,637
Int. Cl.[2] A47K *3/22*
U.S. Cl. 4—145 20 Claims



1. A shower unit comprising:

a panel member formed of plastic material having an upwardly extending ramp surface along a top margin thereof with a plurality of shower nozzles integrally formed in a defined area of the ramp surface;

a plenum assembly sealingly connected about the periphery of the defined area communicating with the nozzles;

open channel means sealingly connected along its exterior margins to the panel member forming a conduit from a water supply main to the plenum; and

a valve sealingly connected and mounted to the panel member interposed in the channel means for controlling the flow of water exiting from the shower nozzles.

4,122,559

SHOWER SCREENS

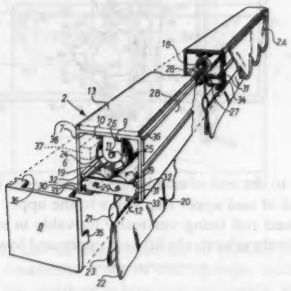
David B. Kelly, "Overwood", Wood La., Off Overdale Rd., Willaston-in-Wirral, Cheshire, England

Filed Mar. 28, 1977, Ser. No. 781,824

Claims priority, application United Kingdom, Apr. 3, 1976, 13581/76; Jun. 25, 1976, 26480/76

Int. Cl.[2] A47K *3/14, 3/22*

U.S. Cl. 4—149 **27 Claims**



1. In the known type of shower screen unit which includes an elongated casing which is adapted to be mounted horizontally, a roller shaft rotatably mounted within the casing, one side of a generally rectangular sheet of screen material being attached to the roller shaft so that as the roller shaft is rotated, the screen material is rolled up on said shaft or unrolled from said shaft, the improvement in said combination comprising at least one freely rotatable water absorbent roller,

(1) said water absorbent roller also mounted within said casing in a position parallel to said roller shaft,

(2) said water absorbent roller being positioned with respect to said roller shaft so that the water absorbent roller will press against the screen material as it is retracted into the casing,

whereby any water on the surface of the screen material that contacts the water absorbent roller is absorbed by the water absorbent roller as the water absorbent roller rotates with the upward movement of the screen material.

4,122,560

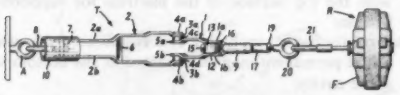
QUICKLY TENSIONED DIVIDER LINE FOR SWIMMING POOLS

William H. Baker, 30 Honeysuckle Woods, Clover, S.C. 29710

Filed Jun. 7, 1977, Ser. No. 804,473

Int. Cl.[2] E04H *3/18*

U.S. Cl. 4—172 **10 Claims**



1. A swimming pool having the pool surface divided into lanes by a plurality of divider lines, comprising, in combination, a swimming pool having at least two opposite sides between which the divider lines extend; a plurality of means along each side for fixedly attaching the divider lines to fixed locations along said sides; and a plurality of quickly tensioned divider lines attached to said means along each side; the divider lines comprising, in combination, a first divider line section adapted for attachment to a first fixed location in a swimming pool; and a tensioning toggle attached to the line section and adapted for attachment to a second fixed location in a swimming pool, the line thereby being located in a divider line position in the pool; the toggle having a bifurcated inner first and second bifurcated outer toggle arms, the first toggle arm being pivotably mounted on the second toggle arm, and movable between retracted and extended positions, in the retracted position being axially coextensive over at least a part of its length with respect to the second toggle arm, and in the extended position being axially extended over at least a part of its length with respect to the second toggle arm; said first toggle arm having a pivot pin linking two portions of said first bifurcated toggle arm, and having first attaching means linked to the pivot pin for pivoting movement therewith with respect to the first toggle arm and nested between the bifurcated inner first toggle arm in the retracted position thereof; and second attaching means on the second toggle arm; the first toggle arm in the retracted position putting a divider line attached to one of the attaching means under relative tension, and in the extended position putting a divider line attached to one of the attaching means under relative slack; and means movable between positions retaining the first toggle arm in the retracted position and releasing the toggle arm from the retracted position to permit it to enter the extended position.

4,122,561

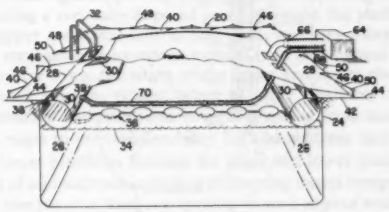
FLOATABLE COVER CAPABLE OF PARTIALLY OR FULLY COVERING SWIMMING POOLS

William D. Barr, 16614 Meadow Rd., Lynnwood, Wash. 98036

Filed Feb. 2, 1977, Ser. No. 764,749

Int. Cl.[2] E04H *3/19, 3/16*

U.S. Cl. 4—172.12 **21 Claims**



1. A floatable cover capable of partially or fully covering swimming pools and the like comprising:

a. a cover sheet of non-porous flexible material which may assume an arched configuration over the pool and having a periphery having the general shape of the pool;

b. an air tube in the approximate shape of the perimeter of the pool and dependently attached at the cover sheet perimeter to the under surface of the cover sheet to abut the interior perimeter of the pool;

c. means for filling the air tube with air having a flexible air feeder tube entering the cover on one side and extending to a point in the air tube on the opposite side of the pool to first introduce air into the latter side of the air tube to inflate that side first so that the cover will automatically draw itself over the pool when the air is first introduced to the deflated cover; and

d. means for introducing air beneath the cover sheet, whereby the cover sheet, upon introduction of air, assumes an arched shape to shed rain and other contaminants falling on the cover sheet.

4,122,562

SUPPORT FRAME AND POOL COVER

Anthony Sorrentino, 45 Pearwood Dr., Huntington Station, N.Y. 11746

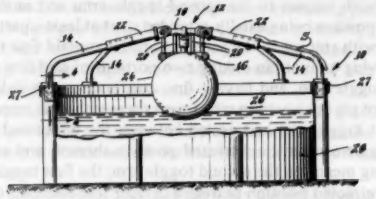
Filed May 19, 1977, Ser. No. 798,366

Int. Cl.[2] E04H *3/19*

U.S. Cl. 4—172.12 **6 Claims**

1. A pool cover for a pool having a perimeter, said pool cover comprising a pool frame and a sheet means which fits over said pool frame, said pool frame including a central ring, a plurality of tubular extensions pivotally coupled to said ring,

a floatation member adapted to fit into said ring and adapted to float on the pool water to support at least part of the weight of



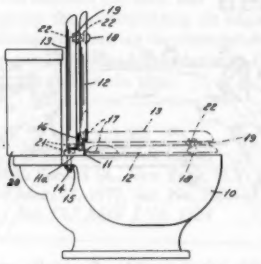
said frame and sheet means, and a plurality of tubular supports each adapted to be secured to a respective one of said extensions and to be secured to the perimeter of the pool.

4,122,563

TOILET SEAT ASSEMBLY

C. Evan Johnson, Onekama, Mich., assignor to Hitachi Magnetics Corp., Edmore, Mich.

Filed Dec. 10, 1976, Ser. No. 749,301
Int. Cl.[2] A47K *13/12*
U.S. Cl. 4—236 **4 Claims**



1. A toilet seat assembly comprising a toilet seat, a cover for said seat, and a hinge connecting said cover to said seat, said hinge having a stationary portion which includes means for mounting said hinge on a toilet bowl, a first magnetic latch positioned between the stationary portion of said hinge and the edge of said cover adjacent said hinge, said latch comprising a magnet securely positioned on one or the other of said stationary hinge portion or cover and a means securely position on the other of said stationary hinge portion or cover and in vertical alignment with said magnet when said cover is in vertical position, said first magnetic latch being operable to maintain said cover in vertical position when the assembly is mounted on a toilet bowl, and a second magnetic latch positioned between said cover and said seat at a point spaced from said hinge, said second magnetic latch being operable to maintain said seat and cover in close proximity to each other.

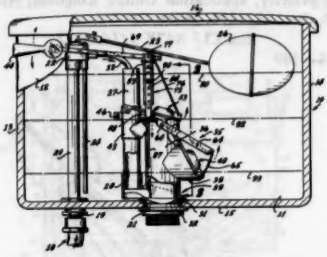
4,122,564

DUAL DISCHARGE VALVE UNIT

Lyle F. Addicks, 12313 Brookshire Ave., Downey, Calif. 90242; Bennie Gift, 9527 Brock Ave., Downey, Calif. 90240, and William R. DiCicco, Jr., 7033 Stewart & Gray Rd. #46, Downey, Calif. 90241

Filed Sep. 23, 1977, Ser. No. 836,086
Int. Cl.[2] E03D *1/14*
U.S. Cl. 4—326 **8 Claims**

1. A selective dual discharge flap valve unit for water flush tanks comprising: a central upright drain pipe having an upper valve port on the top thereof and a lower valve port on the side thereof; upper and lower hingedly mounted flap valves respectively seated on said upper and lower valve ports; a lower having a slot on one end thereof pivotally mounted on the side of said drain pipe; an upright rod having an intermediate shoulder disposed with its lower end portion loosely fitted in the slot of said lever; a lower chain connecting the end of said lower



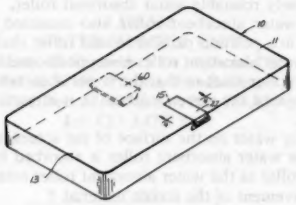
flap valve to the end of said lever; and an upper chain connecting the end of said upper flap valve to the upper end portion of said rod; said rod being vertically movable in either direction to respectively selectively lift said upper and lower flap valves.

4,122,565

MATTRESS ASSEMBLY TO ACCOMMODATE A BEDPAN

Blanche E. Hoben, 1748 Evergreen, Walla Walla, Wash. 99362

Filed Nov. 3, 1977, Ser. No. 848,117
Int. Cl.[2] A61G *7/02*
U.S. Cl. 5—90 **5 Claims**



1. A mattress assembly to accommodate a bedpan comprising:

a single unitary mattress having an upper patient support surface and a parallel bottom surface;

an elongated cavity of a prescribed cross section formed in the upper surface extending from the central area of the mattress to one side of the mattress for receiving the bedpan, said cavity having a bottom wall spaced upwardly of the bottom surface and substantially parallel with the top surface of the mattress for supporting the bedpan;

said cavity further including two countoured side walls;

a first permanent magnet mounted in the bottom wall of the cavity;

a mattress insert having a cross section equal to or slightly larger than that of the cavity;

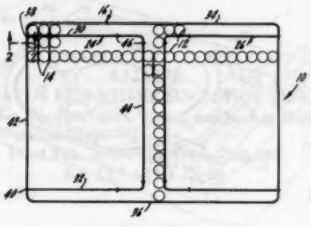
said insert being slidably received in the cavity and having top and bottom surfaces and contoured sides for permitting horizontal sliding movement of the mattress insert in the cavity from a closed position totally filling the cavity and an open position to permit the placement of a bedpan in the cavity supported by the bottom wall with an upper rim of the bedpan being substantially flush with the upper surface of the mattress, and

a second permanent magnet mounted on the bottom of the mattress insert for attracting the first permanent magnet to hold the mattress insert firmly in place when the mattress insert is in the closed position.

4,122,566
FOUNDATION UNIT HAVING A POSTURIZED INNER BORDER

Chester R. Yates, Carthage, Mo., assignor to Steadley Company, Inc., Carthage, Mo.

Filed Mar. 16, 1977, Ser. No. 778,002
Int. Cl.² A47C *23/04*
U.S. Cl. 5—260 **10 Claims**



1. In a spring unit having a plurality of parallel longitudinal columns and transverse rows of coil springs, each row and column being the width of at least one coil spring, and top and bottom perimeter border members connected to the outer edges of the coil springs in the terminal longitudinal columns and transverse rows thereof, the improvement comprising:

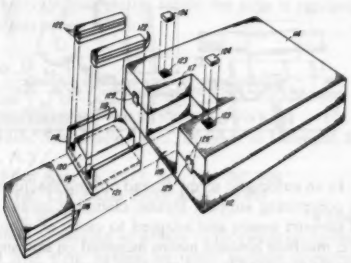
top and bottom recurvate inner border members positioned to coact with at least some of the coil springs when depressed for increasing the depth dimensional firmness of the unit, each member having a pair of parallel side elements extending parallel to, but spaced from, the perimeter border members, each having free end portions of said side elements adjoining a single section of an adjacent perimeter border member, and each having a cross-connecting element uniting said side elements interior of, spaced from and unattached to the perimeter border members, and

means joining the free end portions of each of said inner border members to the single section of the adjacent perimeter border member.

4,122,567
ARTICULATED BED

Paul B. Hanson, 2761 Eastwood Dr., Decatur, Ga. 30032

Continuation-in-part of Ser. No. 702,022, Jul. 2, 1976, Pat. No. 3,991,428, which is a division of Ser. No. 533,980, Dec. 18, 1974, which is a continuation of Ser. No. 406,567, Oct. 15, 1973, abandoned. This application Aug. 2, 1976, Ser. No. 710,597
Int. Cl.² A47C *27/00*
U.S. Cl. 5—345 R **12 Claims**



1. An improved articulated bed, comprising:

(a) a main mattress support having flat top and bottom surfaces and a first cavity disposed in one of its ends;

(b) a main mattress on said top surface and having a second cavity disposed along one of its ends in registry with said first cavity;

(c) removable support means within the first cavity;

(d) removable mattress means within said second cavity and being supported on said removable support means, said support means and said mattress means being selectively removable from said respective cavities to facilitate use of said main mattress and said cavities for sexual intercourse; said removable support means includes a plurality of pads stacked one on the other.

4,122,568
MATTRESS OF THE HARD SURFACE TYPE

José R. R. Bastos, and Eduardo R. Bastos, both of 16 Aurelino Leal St., Rio de Janeiro, Brazil

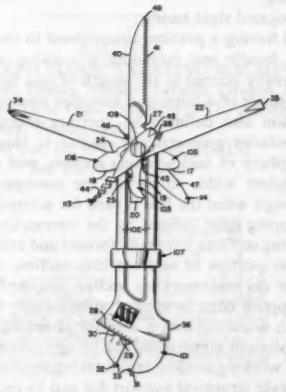
Filed Jun. 10, 1977, Ser. No. 805,469
Int. Cl.² A47C *27/04*
U.S. Cl. 5—345 R **5 Claims**

1. A mattress of the hard-surface type comprising a plurality of vertical rigid supporting members, each supporting member including a vertically disposed post and a rigid, flat platform at the upper and lower ends of said posts, said supporting members arranged side-by-side in a plurality of longitudinal and in transverse rows, the edges of the upper and lower platforms disposed adjacent related edges of other platforms in said longitudinal and transverse rows and spaced from said adjacent edges to provide flexability for said mattress, said upper and lower platforms forming the upper and lower planar surfaces of said mattress, including connecting means comprises at least one pin an at least one opening on each edge of said upper and lower platforms whereby the pins of one platform engages in a related opening of an adjacent platform.

4,122,569
INTEGRATED UNIVERSAL TOOL

Thomas H. Hitchcock, Box 8644, San Marino, Calif. 91108

Filed May 27, 1976, Ser. No. 690,799
Int. Cl.² B25F *1/04*
U.S. Cl. 7—134 **5 Claims**



1. A composite hand tool comprising: a frame, open at one end and closed at the opposite end thereof; said frame compris-

ing a pair of rails extending between said open and said closed end;

a first tool element forming a part of said closed end of said frame;

a first axle means mounted in and bridging said open end of said frame;

a second tool element pivotally mounted on said first axle means and being positionable thereon for storage nesting between said rails;

a second axle disposed in said second tool element and perpendicular to the axis of said first axle, said second axle forming a universal joint with said first axle;

a plurality of additional tool elements mounted on said second axle, each of said plurality of additional tool elements being individually articulatable on said second axle selectively to a use position and a storage position; and;

a keeper slidably disposed about said frame and being positionable thereon for holding any of said plurality of tool elements rigid and in an adjacent and parallel position relative to said frame when said tool elements are in said storage position and holding any extended tool elements in place in the use positions thereof, said keeper being slidably movable to another position on said frame whereby said second tool element is rotatable freely on said first axis and said plurality of additional tool elements may be rotated about said second axle unhindered.

4,122,570

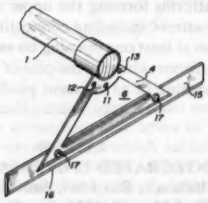
CULTIVATING SYSTEM

Francis P. Otken, 6611 Joliet Dr., Lubbock, Tex. 79413, and Henry L. Otken, 134 McGehee Dr., Baton Rouge, La. 70815

Filed Mar. 7, 1977, Ser. No. 775,376

Int. Cl.² B25F *1/02*

U.S. Cl. 7—114 **14 Claims**



1. An improved hoe for scraping and chopping soil and capable of having an implement selectively mounted thereto comprising:

an elongated rigid handle;

a head having a portion dimensioned to receive the end of said handle and including a working section disposed generally normal to the length of said handle and having the shape of a truncated isosceles triangle, said working section also defining an aperture therethrough having boundaries geometrically similar in shape to the outer periphery of said working section, said aperture having sufficient width to permit the passage of earth therethrough when the hoe is used for scraping; and

a chopping edge defined by the intersection of two planar cutting surfaces integrally formed and extending along the lower portion of said working section, said cutting surfaces on said working section disposed such that said chopping edge is applied substantially normally to the earth when the tool is used for chopping;

an implement constructed for being removably attached to said working section, said working section dimensioned to provide structural support for and to receive said implement; and

means for removably fastening said implement to said working section to perform a selected function.

4,122,571

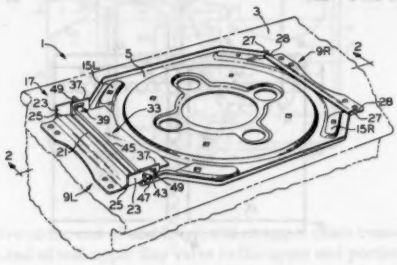
BOAT SEAT LATCHING ASSEMBLY

Denis S. Moeser, Clayton, Mo., assignor to Leisure Products, Inc., St. Louis, Mo.

Filed Jul. 11, 1977, Ser. No. 814,680

Int. Cl.² B63B *29/00*

U.S. Cl. 9—7 **21 Claims**



1. A latching assembly for rigidly mounting a seat on a boat thwart or the like comprising a base adapted to rest on top of the thwart and to have the seat secured thereto, a pair of keepers adapted to be mounted on top of the thwart for securing opposite sides of the base to the thwart, at least one latch mounted on one of said opposite sides of the base, the latch being selectively movable from a retracted position to an extended latching position in which the latch projects beyond the respective side of the base and underlies one keeper thereby to prevent vertical movement of the base relative to the thwart, and means for locking the latch in its latching position, the end of the latch being adapted to abut its respective keeper to block side-to-side movement of the base on the thwart when the latch is locked in its latching position, and the sides of the latch being adapted to abut the keeper to block movement of the base on the thwart in a front-to-back and back-to-front direction when the latch is in its latching position.

4,122,572

ADVANCING MECHANISM FOR AUTOMATIC SCREW THREAD CUTTING MACHINES

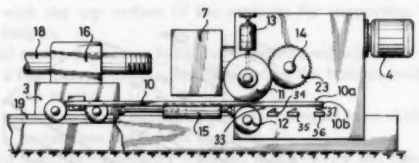
Kurt Pauls, Langenfeld, Fed. Rep. of Germany, assignor to Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Jul. 28, 1977, Ser. No. 819,827

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638626

Int. Cl.² B23G *11/00*; B23Q *5/26*

U.S. Cl. 10—105 **8 Claims**



1. In an automatic screw thread cutting machine, a combination comprising support means; clamping means mounted on said support means and adapted to carry an elongated workpiece; machine housing means mounted on said support means; a spindle mounted in said machine housing means for rotation about its axis and being arranged coaxial with a workpiece carried by said clamping means axially spaced therefrom, one of said two means mounted on said support means being movable in direction of said axis towards the other of said two means; a threading tool carried by an end of said spindle facing

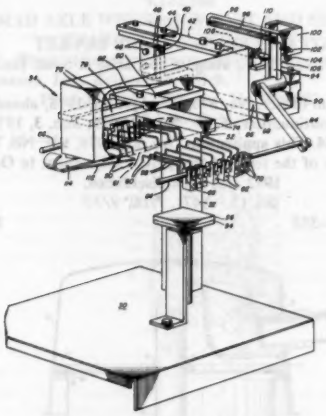
said clamping means; a drive motor; a speed reducing transmission between said drive motor and said spindle; and advancing means for moving said one of the two means mounted on said support means towards the other of said two means and including at least one exchangeable friction wheel having a smooth peripheral friction surface, a further speed reducing transmission means between said spindle and said friction wheel, and a friction surface extending in said direction, engaging with said friction wheel and connected to one of the first-mentioned two means.

4,122,573

APPARATUS FOR STIFFENING SHOE INSOLES

Leo F. Stanton, Newburyport, Mass., assignor to Bush Universal, Inc., Woburn, Mass.

Filed Feb. 3, 1977, Ser. No. 765,095
Int. Cl.[2] A43D *31/00*
U.S. Cl. 12—18.3 21 Claims



1. An apparatus for applying a strip of externally activatable material to the bottom of an insole to form a shank in situ on the bottom of the insole, said strip including an externally activatable matrix surrounded by a sleeve, said apparatus comprising:

means for resiliently urging the strip toward, and for retaining the strip in, a predetermined position on the bottom of the insole; and

activating means, disposed at a location spaced from said urging and retaining means, for generating an external stimulus and directing said external stimulus toward said strip to activate said matrix while the strip is retained in said predetermined position.

4,122,574

METHOD OF MAKING FOOTWEAR

Victor L. Karalis, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

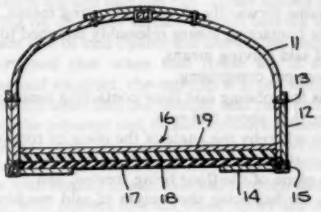
Filed Apr. 14, 1977, Ser. No. 787,408
Int. Cl.[2] A43D *9/00*; A43C *13/08*
U.S. Cl. 12—142 RS 6 Claims

1. The method of making an article of footwear comprising:

stitching a first strip having an outer surface comprising uncured elastomeric material to the lower edge of an upper of an article of footwear;

stitching a second strip having inner and outer surfaces comprising uncured elastomeric material to said first strip at approximately a right angle thereto;

attaching said inner surface of said second strip to the bottom surface of an insole; and



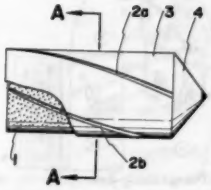
attaching said outer surface of said second strip to the top surface of an outsole.

4,122,575

TUBE CLEANING MATERIAL

Teikichi Sagawa, Chigasaki, Japan, assignor to Nihon Pipeline Service Kabushiki Kiahsa, Tokyo, Japan

Filed May 9, 1977, Ser. No. 794,735
Int. Cl.[2] B08B *9/04*
U.S. Cl. 15—104.06 R 3 Claims



1. A tube cleaning material comprising:

(a) a cylindrical body, the body being formed from a compressible elastic material and having a diameter somewhat larger than the inner diameter of a tube to be cleaned;

(b) at least one spiral groove in the peripheral surface of said cylindrical body extending in the same direction from the front to the rear end of said cylindrical body, and

(c) a polishing member provided on the surface of said cylindrical body,

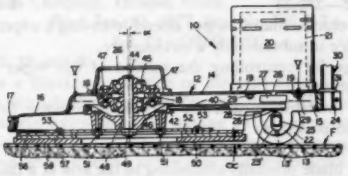
wherein said groove has a width and depth which are increasingly larger toward the front end of said cylindrical body.

4,122,576

HIGH-SPEED FLOOR TREATING MACHINE

John F. Bevington, Toledo; Michael Savidge, Oregon, and Paul Meeker, Toledo, all of Ohio, assignors to The National Super Service Company, Toledo, Ohio

Filed Jul. 11, 1977, Ser. No. 814,158
Int. Cl.[2] A47L *11/162*
U.S. Cl. 15—49 R 29 Claims



1. In a floor treating machine comprising:

A. a frame,

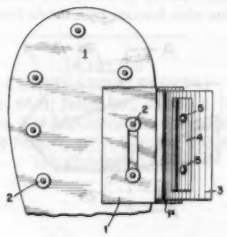
B. a guiding and control handle attached to said frame,
C. a supporting means of said frame,
D. an electric motor mounted on said frame,
E. a driving means rotated by said motor and mounted on said frame forwardly of said supporting means, and
F. a floor contacting means releasably attached to the floor side of said driving means,
the improvement comprising:
G. means for rotating said floor contacting means at a speed greater than about 600 rpm,
H. means whereby the angle of the plane of rotation of said floor contacting means is preset to be less than about 10° to the plane of the floor being treated, and
I. means for balancing the weight of said machine on said supporting means whereby the majority of the weight of said machine is supported by said supporting means.

4,122,577

GOLF SHOE WIPING ATTACHMENT FOR GOLF CLUB HEADS

Salvadore Catania, 67 Wall St., New York, N.Y. 10005

Filed Jun. 24, 1976, Ser. No. 699,251
Int. Cl.[2] A46B *17/02*; A63B *57/00*
U.S. Cl. 15—160 **2 Claims**



1. A wiping attachment adapted to be attached to a golfer's shoe for cleaning golf club heads, comprising a plate formed with an elongated slot of such length and width to receive and to be frictionally held by two spaced spikes projecting from the underside of a golfer's shoe, said plate carrying at one side an upwardly and outwardly extending holding plate that would project at an incline away from the golfer's shoe, a wiping element, and means to secure the wiping element to the outer face of said holding plate with a portion of the wiping element extending thereabove, the wiping element being operative to clean a golf club head by a sweeping movement of the head against the same.

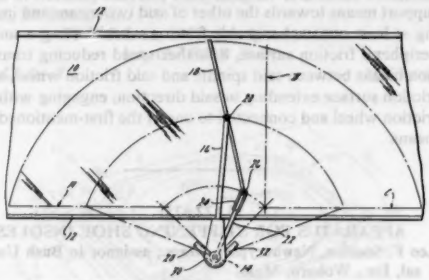
4,122,578

WINDOW WIPER ASSEMBLY

John E. Pretty, Brentwood, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 24, 1977, Ser. No. 827,401
Claims priority, application United Kingdom, Nov. 30, 1976, 49804/76
Int. Cl.[2] B60S *1/32, 1/40*
U.S. Cl. 15—250.23 **5 Claims**

5. In a vehicle window wiper assembly having a wiper blade reciprocable in substantially a circular arc,
a linkage for controlling the motion of the wiper blade, comprising:
a shaft rotatable in alternate directions between first and second positions,
an arm secured to the shaft for rotation therewith,
a wiper blade pivotally connected to the arm at a fixed first location spaced from the shaft, a radius arm mounted on the shaft for rotations relative thereto, a sliding connection between the radius arm and the wiper blade at a second location spaced from the shaft and from the first location, and stop means limiting movement of the radius



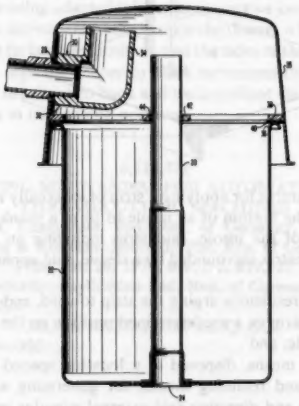
arm to an arc less than the arc between the first and second positions of the shaft.

4,122,579

STEAM CLEANER DUMP BUCKET

Carl Parise, Reno, Nev., assignor to Parise & Sons, Inc., Reno, Nev.

Continuation of Ser. No. 570,973, Apr. 23, 1975, abandoned, which is a continuation of Ser. No. 476,029, Jun. 3, 1974, Pat. No. 3,911,524. This application Dec. 21, 1976, Ser. No. 753,164
The portion of the term of this patent subsequent to Oct. 14, 1992, has been disclaimed.
Int. Cl.[2] A47L *7/00, 9/10*
U.S. Cl. 15—353 **1 Claim**



1. A dump bucket for a steam cleaner, said dump bucket comprising:
an upwardly open, lower, cup-shaped member having an aperture in the bottom thereof;
a hollow riser tube fixed to the bottom of said lower cup-shaped member, being open to said aperture and extending upwardly therefrom to a height above the open top of said lower cup-shaped member;
a downwardly open, upper cup-shaped member, said upper cup-shaped member having an aperture in the side thereof;
an inwardly extending annular shelf carried by said upper cup-shaped member on the inner side surface of said upper cup-shaped member above said lower cup-shaped member, extending the full circumference of said upper cup-shaped member and contacting said lower cup-shaped member in an air-tight seal;
an L-shaped hollow connector, means for mounting said L-shaped hollow connector to the wall of the upper cup-

shaped member with a first leg of which extending inwardly from said aperture in said upper cup-shaped member and a second leg of which extends upwardly from said first leg stopping short but in proximity to the inner surface of the top of said upper cup-shaped member; and

strut means extending across said upper cup-shaped member from one portion of said annular shelf to another portion thereof and being integral therewith, said strut means intersecting said riser tube and being apertured to receive the upper end of said riser tube;

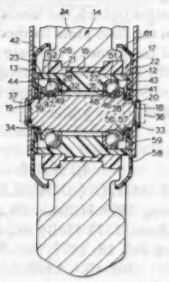
whereby, if vacuum is applied to the aperture in said lower cup-shaped member and a steam cleaner vacuum wand is connected to the exterior end of said first leg of said L-shaped hollow connector, dirty water will forced through said L-shaped hollow connector and sprayed against the inner surface of the top of said upper cup-shaped member, after which it will run down the sides of said upper and lower cup-shaped members without going down said hollow riser tube.

4,122,580

SOLID AXLE WHEEL SUPPORT AND SEALED BEARING CONSTRUCTION

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Jun. 15, 1977, Ser. No. 806,903
Int. Cl.[2] B60B *33/00*
U.S. Cl. 16—46 **4 Claims**



1. A wheel construction for a tire having a central coaxial opening therethrough, comprising:

a cylindrical sleeve fixedly disposed in said central opening in said tire, said sleeve having a portion of reduced inside diameter spaced from both axial ends thereof;

a pair of outer bearing races snugly disposed within said sleeve against the opposite axial ends of said portion of reduced diameter;

a solid cylindrical axle having spaced portions of reduced diameter defining spaced shoulders near the opposite ends thereof, said axle being disposed coaxially within and spaced from said reduced portion of said sleeve and extending axially beyond both ends thereof;

a pair of inner bearing races encircling said axle and radially aligned with said outer bearing races and antifriction means positioned between respective pairs of said bearing races;

a pair of axially spaced first upset portions on said axle located between said shoulders and pair of inner bearing races to fixedly hold said inner bearing races to said axle, said first upset portion defining a seal shoulder between said inner bearing races at one end of said axle and the respectively adjacent shoulder and including a generally circular and resiliently flexible end cap encircling said axle and bearing against said seal shoulder;

frame legs encircling said axial extensions of said axle and bearing snugly against said shoulders and a second upset portion at the end of each axial extension bearing against the leg adjacent thereto and holding same firmly against the respectively adjacent shoulder, said end cap having a portion thereof extending axially outwardly from said shoulder to bear against the inner face of the axially adjacent frame leg and said end cap further having an annular seal ring on the inner surface thereof bearing against the adjacent end of said cylindrical sleeve, the parts being so proportioned that when said frame leg is in position against said shoulder, the end cap is urged snugly against the seal shoulder and the annular seal ring thereof urged against the adjacent end of said cylindrical sleeve;

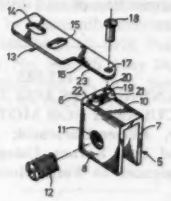
whereby said inner bearing races are locked permanently to said axle and said frame legs are locked permanently and firmly with respect to said axle and through said axle held rigidly with respect to each other all by the material of said solid axle.

4,122,581

FURNITURE HINGE

Willi Pittasch, Herford, Fed. Rep. of Germany, assignor to Richard Heinze, Fed. Rep. of Germany

Filed May 27, 1976, Ser. No. 690,526
Int. Cl.[2] E05D *5/02*
U.S. Cl. 16—158 **19 Claims**



1. A hinge for pivoting and guiding a furniture door on a furniture body which encloses a space defined by walls and closed by a door, including in combination:

a first hinge member attachable to the inner surface of one of said walls of said furniture body inside said body and including a flat bracket which is disposed at right angle to a pivot axis at one end of said bracket; and

a second unitary hinge member attachable to the furniture door and being pivotally connected to the bracket at said pivot axis by a pivot pin,

said second hinge member being formed by a U-profile having two arms with one of said arms forming first wall means abutting the door outside face and visible when the door is closed,

with said arms connected to each other by a yoke forming second wall means abutting a side face of the door, and with said two arms of said U-profile, which encloses the door in form of a clamp, being connected to each other additionally by a stiffening web forming third wall means at right angles to the first and to the second wall means.

4,122,582

FIBER MAT FORMING MACHINE

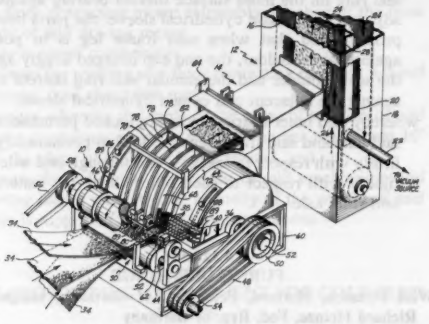
Raymond A. Van Vliet, Castle Rock, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Jan. 12, 1977, Ser. No. 758,612
Int. Cl.[2] D01G *5/00*
U.S. Cl. 19—65 R **4 Claims**

1. In a fiberizing machine of the type having a fiberizing station into which compacted fiber sheets are fed, a cylindrical transversely extending shell having an infeed opening at the fiberizing station and an opening circumferentially spaced from the infeed opening at the inlet end of a conduit extending outwardly from the shell, and a cylindrical rotor mounted within the shell and having means thereon for mechanically fiberizing incoming fiber sheets, said rotor and the inside surface of the shell defining a transversely extending annular

volume within which an air-fiber mixture is formed at the fiberizing station and then flows circumferentially within at least a portion of the volume, the improvement comprising:

a portion of said shell diverging circumferentially outwardly



from substantially adjacent the infeed opening and extending to a position substantially adjacent the inlet end of said conduit and terminating at the opening thereto, with the transverse dimension of said diverging portion being less than the transverse dimension of said shell.

4,122,583

FASTENING CLIPS FOR TRIM PANELS PARTICULARLY FOR MOTOR VEHICLES

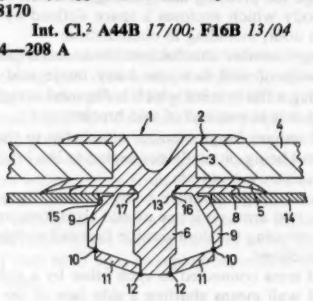
Heinz Grittner, Kürten-Dürscheid; Ralph Giese, Frechen-Buschbell, and Paul Korner, Cologne, all of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 10, 1978, Ser. No. 895,196

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718170

Int. Cl.² A44B *17/00*; F16B *13/04*

U.S. Cl. 24—208 A **7 Claims**



1. A fastening clip for upholstered covering elements in particular motor vehicle trim elements, the fastening clip having a flat, disc-shaped retainer head extending perpendicularly to the clip axis, a central circular neck having a length corresponding to the thickness of a trim element, a thin disc-shaped sealing collar disposed parallel to the retainer head and retention elements attached to the latter, the retention elements consisting of at least two mutually oppositely disposed resilient arms which cooperate through detent shoulders with a locating hole in a vehicle body panel characterized in that the sealing collar is adjoined by a central rectangular shank connected through a deliberate frangible point to a supporting disc of part circular shape on whose underside two clip arms extend parallel to the clip axis and away from a supporting disc, these arms having substantially rectangular cross sections and being formed in such a fashion that they can be inclined, the other ends of these arms being articulated through integral hinges to spreader arms extending back substantially parallel to the clip axis to the supporting disc, these spreader arms having rectangular cross sections and being articulated through integral hinges to an end of the shank which extends downwards beyond the deliberate frangible point, the shank exhibiting at the top of its transverse sides detent grooves which cooperate with the break edges, these being designed as detent edges, of the deliberate frangible point.

4,122,584

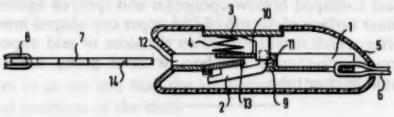
LOCK FOR MOTOR VEHICLE SAFETY BELTS

Artur Föhl, Schorndorf, Germany, assignor to Repa Feinstanzwerk GmbH, Aldorf, Germany

Filed Sep. 16, 1977, Ser. No. 833,769

Int. Cl.² A44B *11/25*

U.S. Cl. 24—230 A **4 Claims**



1. In a lock for motor vehicle safety belts having a metallic base plate with a recess in which a latching member having a latching projection is supported so that the latching member can be swung by a pushbutton against the action of a spring from the closed position about an axis extending transversely to the insertion direction of a plug-in blade, said plug-in blade having an undercut, the latching projection of the latching member snapping into said undercut of the plug-in blade upon insertion of the latter to lock the blade, the improvement comprising a recess in the base plate formed by punching free a lug, which bent out of the plane of the base plate is unitary with and spaced up from the base plate, forming an upper guide for the plug-in blade, and with said latching member inserted in said recess beneath said upper guide.

4,122,585

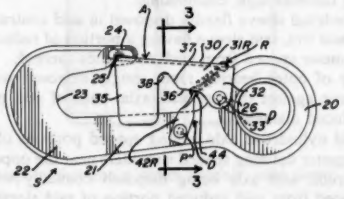
SINGLE-ACTION DOUBLE-LOCK SNAP

Jonathan E. Sharp, 3999 Hillside Dr., Littleton, Colo. 80123, and Frank R. Ross, 1371 Holly St., Denver, Colo. 80220

Filed Jul. 18, 1977, Ser. No. 816,447

Int. Cl.² A44B *13/02*

U.S. Cl. 24—241 SB **3 Claims**



1. In a single-action, double-lock snap, of the type combining a snap hook including a shank portion and a hook at one end thereof, with a throat portion between the point of the hook and the shank; and a lock arm having a laterally offset pivot head at one end of the arm overlying the shank at the end portion opposite to the hook and being connected thereto by a lock arm pivot with the opposite end of the lock arm being swingable across the throat portion to engage the hook point to close the snap and to lie adjacent to the shank to open the snap, the improvement comprising:

(a) a detent pivotally mounted on the shank between the hook and the lock arm pivot to extend laterally to engage the lock arm and to swing towards the hook and towards the lock arm pivot;

(b) a cam surface on a side of the lock arm engaged by the detent having a seat portion adjacent to the lock arm pivot

head and a pocket adjacent to the hook, whereby to lock the lock arm in engagement with the point of the hook to close the snap when the detent is swung towards the lock arm pivot and onto the seat portion and to permit the lock arm to lie adjacent to the shank to open the snap when the detent is swung towards the hook and into the pocket; and

(c) a spring tensioned between the detent and to the lock arm adjacent to the laterally offset pivot head whereby the spring normally pulls the detent towards the lock arm pivot and onto the cam seat portion to hold the snap closed and whereas pressure against the detent to swing the detent towards the hook pulls the spring to swing the lock arm against the shank to open the snap.

4,122,586

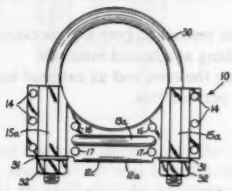
PIPE CLAMP SADDLE

Carl Nothdurft, 22412 Lavon, St. Clair Shores, Mich. 48084

Filed Jul. 19, 1976, Ser. No. 706,757

Int. Cl.[2] B65D *63/00*; F16L *3/10*

U.S. Cl. 24—277 **1 Claim**



1. An improvement in a U-bolt type pipe clamp saddle for clamping a pipe joint, said pipe clamp saddle having a pair of spaced-apart sleeve portions and a web therebetween, said improvement comprising said web having a tubular strengthening rib therein; said pipe clamp saddle being formed from a single metal stamping having a transverse line of symmetry thereacross from which a pair of opposed allochiral halves extend and along which line said stamping is folded forming said web, said sleeves and said tubular strengthening rib; portions of said opposed allochiral halves being spot welded together in coextensive, facially contacting relation; said fold being along the bottom edge of said web; each sleeve extending substantially perpendicularly to the fold and adjacent an edge of said web, the cross section of said sleeves being hexagonal; said tubular strengthening rib being formed from matching deformations in said allochiral halves.

4,122,587

PATIENT SECURING DEVICE

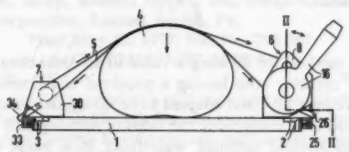
Karl Weiss, Erlangen-Buckenhof, and Helmut Rost, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 24, 1977, Ser. No. 771,447

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1976, 2610830

Int. Cl.[2] A61F *5/37*

U.S. Cl. 128—134 **14 Claims**



1. In a device for securing a patient to an examination table including an examination table, a belt for extending between the sides of the table over the top of the table and holder mechanisms including base means attached to the table adjacent each side thereof with the belt passing between the holder mechanisms, and means for tensioning the belt, the improvement of one of the holders being equipped with a freewheeling roller around which the belt passes, and a second holder having a slower revolvable take-up drum and a faster revolvable take-up drum mounted therein in parallel relationship to one another, said slower revolvable drum being mounted closest to said base means opposite ends of the belt being attached one end respectively to one drum and the other end respectively to the other drum, the belt passing around the freewheeling roller, selectively actuatable means or revolving the drums simultaneously including gear means on each drum for revolving the drums together at different relative rotational speeds whereby, the belt, when passed around the freewheeling roller having a lower stretch extending from a slower revolving drum across the examination table, closest to the surface of the examination table and another stretch passing across the examination table above the first mentioned stretch the other stretch attached to a faster revolving drum.

4,122,588

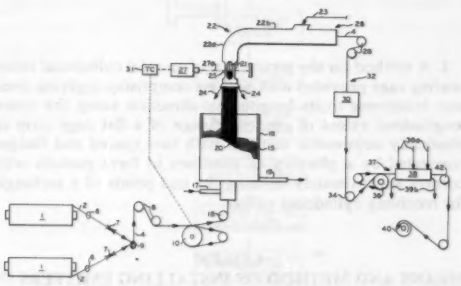
YARN PROCESSING APPARATUS

David E. Borenstein, and Richard C. Newton, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 559,158, Mar. 17, 1975, Pat. No. 4,002,398, which is a division of Ser. No. 363,480, May 24, 1973, Pat. No. 3,886,636. This application Jun. 30, 1976, Ser. No. 701,455

Int. Cl.[2] D02G *1/20*

U.S. Cl. 28—221 **2 Claims**



1. Apparatus for processing yarn in one continuous operation without allowing the yarn to cool to ambient temperature comprising:

a first means for heating the yarn comprising a first heated roll and a second heated roll operated at a higher peripheral speed as compared to the first heated roll so that the yarn is heated and drawn,

a crimping means positioned to receive the drawn and heated yarn and to crimp the yarn and form a yarn plug comprising a fluid jet portion and a chamber containing a plurality of stacked members,

a tube positioned for receiving the yarn plug from the crimping means and a means for supplying a fluid to said tube in a direction counter-current to the direction of movement of the yarn plug in the tube,

a yarn plug control means for sensing the length of the yarn plug in the tube and adjusting the temperature of the second heated roll of the first heating means to control the length of the yarn plug,

an entangling means positioned for receiving and entangling the crimped yarn,

a second means positioned for receiving and increasing the temperature and tension of the heated, crimped and entangled yarn to produce a straightened, crimped and entangled yarn comprising a longitudinal chamber having a

yarn inlet and a yarn outlet and a source of heating fluid attached to said chamber, and

a winder positioned for winding the straightened, crimped and entangled yarn.

4,122,589

METHOD OF PRODUCING AXIAL ROLLER BEARING CAGES

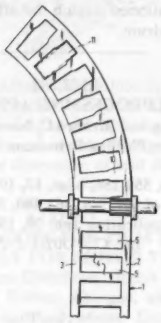
Robert Grimm, Herzogenaurach, and Hartmut Koschmieder, Erlangen, both of Germany, assignors to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed May 26, 1977, Ser. No. 800,949

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1976, 2626398

Int. Cl.[2] B21D *53/12*; B21H *1/12*

U.S. Cl. 29—148.4 C **5 Claims**



1. A method for the production of an axial cylindrical roller bearing cage provided with pockets comprising applying pressure transverse to its longitudinal direction along the entire longitudinal extent of one end flange of a flat cage strip of plastically deformable material with two spaced end flanges connected by a plurality of crossbars to form pockets with corners approximately defining the end points of a rectangle for receiving cylindrical rollers.

4,122,590

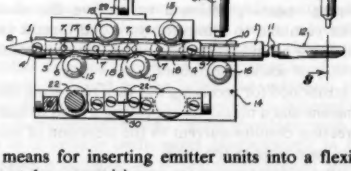
MEANS AND METHOD OF INSTALLING EMITTERS IN IRRIGATION TUBING

Lloyd Spencer, 220 Patrician Way, Pasadena, Calif. 91105

Filed May 9, 1977, Ser. No. 794,977

Int. Cl.[2] B23P *15/00, 13/00, 23/00*

U.S. Cl. 29—157 C **10 Claims**



1. A means for inserting emitter units into a flexible wall irrigation tube, comprising:

a. a core assembly having a body dimensioned to move freely in an irrigation tube of a selected size;

b. internal rollers carried by the body positioned to contact axially offset diametrically disposed portions of the inner surface of the irrigation tube;

c. external rollers positioned to engage corresponding axially offset diametrically disposed portions of the outer surface of the irrigation tube, the relative positions of the internal and external rollers being such as to restrain the core assembly against longitudinal movement in at least one longitudinal direction while permitting passage of the irrigation tube between the pairs of the internal and external rollers;

d. perforating means including an internal element fixed to the core assembly and a radially movable external element engageable with the internal element to effect a perforation in the irrigation tube;

e. and an emitter inserting means including an internal in fixed to the core in preselected spaced relation to the perforating means and an external element adapted to removably receive an emitter and move the emitter radially into cooperative relation with the internal element to secure the emitter with respect to the perforation.

9. A method for installing emitters in flexible irrigation tubes, characterized by:

a. inserting a core having rollers into an irrigation tube;

b. rotatably engaging the irrigation tube externally to depress the irrigation tube into restraining contact with the core rollers;

c. moving the irrigation tube axially while the core is restrained;

d. utilizing the restrained core and an external tool to perforate the tubing at selected intervals;

e. and utilizing the core and an external tool to install emitters in the perforations.

4,122,591

CATHETER

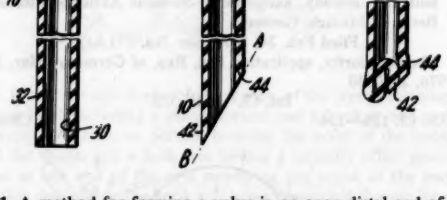
Bernhard Kramann, Planegg, and Heinrich Tammen, Munich, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik - GmbH, Constance, Germany

Division of Ser. No. 571,984, Apr. 28, 1975, Pat. No. 4,043,345. This application Jun. 1, 1977, Ser. No. 802,547

Claims priority, application Fed. Rep. of Germany, May 2, 1974, 2421294

Int. Cl.[2] B23P *15/00*

U.S. Cl. 29—157 R **5 Claims**



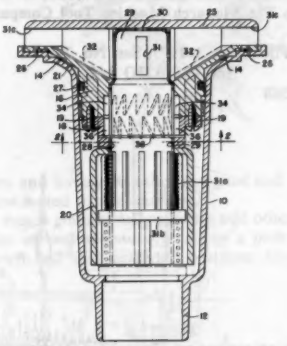
1. A method for forming a valve in an open distal end of a hollow catheter hose having a proximal end connected to a fluid pressure tube and adapted to be invaginated and exserted from said tube comprising the steps of forming said distal end with an annular terminal wall lying in a plane extending obliquely to the axis of said hose, said terminal wall surrounding said open distal end of said hose, said distal end thus being configured with a longer side and a shorter side, and subsequently folding said longer side to be reentrant into said tube in overlapping abutment with said shorter side.

4,122,592

TEST PLUG ASSEMBLY AND METHOD FOR PRESSURE TESTING THE INLET CONNECTION FOR LIQUID JET FLOOR OUTLET FITTINGS

Gordon F. Ehret, Alhambra, and William N. Rowley, Palos Verdes Estates, both of Calif., assignors to Wylain, Inc., Dallas, Tex.

Filed Feb. 28, 1977, Ser. No. 773,013
Int. Cl.[2] F16L *55/10*; G01M *3/04*
U.S. Cl. 29—404 8 Claims



1. An improved test plug assembly of the type adapted to form a pressure resistant test seal in a liquid jet producing device, the liquid jet producing device comprising a housing with a shaped upper portion, a plurality of studs spaced around and projecting from the inner surface of the housing, an internal liquid jet producing mechanism adapted to be inserted in the housing, the upper portion of the mechanism including an undersurface shaped and dimensioned to mate with said shaped upper portion, a plurality of flanges projecting from the outer surface of the mechanism located and spaced apart so that the studs can pass between the flanges when the mechanism is inserted into the housing and so that the uppermost surface of the flanges will engage the lowermost surface of the studs when the said shaped upper portion and said undersurface portion are in contact and the mechanism is rotated relative to the housing for holding the mechanism in place, the improved test plug assembly comprising a body adapted to be inserted into the housing and prevent liquid under pressure from flowing therethrough, the body including an undersurface shaped and dimensioned to mate with said shaped upper portion, a plurality of flanges projecting from the outer surface of the body located and spaced apart so that the studs can pass between the flanges when the body is inserted into the housing and so that the uppermost surface of the flanges will engage the lowermost surface of the studs when said shaped upper portion and said undersurface are in contact and the body is rotated relative to the housing, and gripping means for gripping the body so it can be rotated into engagement with the housing.

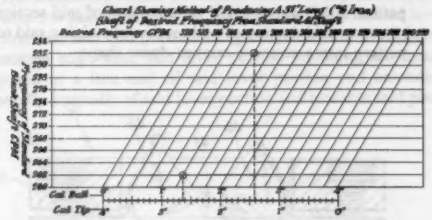
4,122,593

METHOD OF MAKING GOLF CLUB SHAFTS

Joseph M. Braly, Kennett Square, Pa., assignor to Con-Sole Golf Corporation, Kennett Square, Pa.

Filed May 12, 1977, Ser. No. 796,080
Int. Cl.[2] B23Q *17/00*; A63B *69/36*
U.S. Cl. 29—407 7 Claims

1. A method of producing a golf club shaft of predetermined natural frequency and length from an oversized universal blank shaft of given length having tip and butt end portions and a natural frequency within a given range, the method including the steps of measuring the actual natural frequency of the blank shaft, determining relative amounts of material to be removed from the tip and butt end portions of the blank shaft to obtain the desired length and natural frequency of the shaft being produced, removing the relative amounts of shaft material so determined from both the tip and butt end portions of blank shaft, the total amount of material removed from the blank solely depending upon the length of the shaft desired, and the



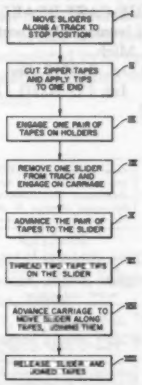
relative amounts removed from the tip and butt end portions of the blank solely depending upon the natural frequency of the shaft desired.

4,122,594

METHOD FOR ENGAGING A SLIDER AUTOMATICAL..Y ON A SLIDE FASTENER CHAIN

Anthony A. Azzara, Brooklyn, N.Y., assignor to Bruning Bros. Co., Inc., Commack, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,773
Int. Cl.[2] B21D *53/50*
U.S. Cl. 29—408 8 Claims


MOVE SLIDERS ALONG A TRACK TO STOP POSITION
I
CUT ZIPPER TAPES AND APPLY TIPS TO ONE END
II
ENGAGE ONE PAIR OF TAPES ON HOLDERS
III
REMOVE ONE SLIDER FROM TRACK AND ENGAGE ON CARRIAGE
IV
ADVANCE THE PAIR OF TAPES TO THE SLIDER
V
THREAD TWO TAPE TIPS ON THE SLIDER
VI
ADVANCE CARRIAGE TO MOVE SLIDER ALONG TAPES, JOINING THEM
VII
RELEASE SLIDER AND JOINED TAPES
VIII

1. A method of engaging sliders upon slide fastener tapes having chains of teeth thereon to make assemblies each consisting of two of said tapes and one of said sliders, comprising the steps of:

automatically moving a slider laterally to a tape engaging position from a track containing a single file of sliders;

automatically advancing one pair of tapes to said slider and simultaneously inserting one end of each of said tapes into said slider; and

continue moving said tapes toward said slider so that teeth following said one end move through said slider and are mutually engaged to form a slide fastener assembly.

4,122,595

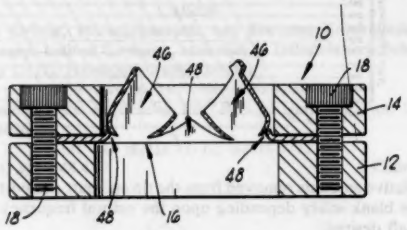
SCORED RUPTURE DISK MANUFACTURING METHOD

Loren E. Wood; John E. Witten, and Edward H. Short, III, all of Tulsa, Okla., assignors to Black, Sivalls & Bryson, Inc., Houston, Tex.

Filed Aug. 12, 1977, Ser. No. 824,161
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—424 9 Claims

1. A method of manufacturing a second rupture disk comprising the steps of:

(a) forming a flat section of sheet metal into a desired peripheral shape;
(b) applying a coating of flexible corrosion-resistant material to one side of said section in a manner whereby a score pattern is left unprotected on a portion of said section;
(c) forming said portion of said section containing said score pattern into a concave-convex dome shape;



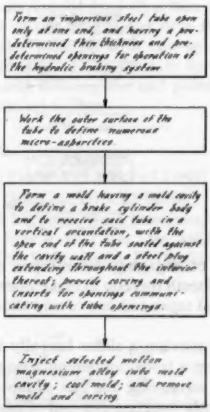
(d) contacting said side of said concave-convex dome portion containing said score pattern with a corrosive fluid for a period of time sufficient to corrode scores corresponding with said score pattern of desired depth into said section; and
(e) removing said corrosion-resistant material from said section.

4,122,596

MAGNESIUM DIE-CAST BRAKE MASTER CYLINDER

Everett H. Fields, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1977, Ser. No. 839,708
Int. Cl.² B22D *11/126*
U.S. Cl. 29—527.2 **7 Claims**


Form an impervious steel tube open only at one end, and having a predetermined wall thickness and predetermined openings for operation of the hydraulic braking system
Work the outer surface of the tube to define numerous micro-asperities
Form a mold having a mold cavity to define a brake cylinder body and to receive said tube in a vertical orientation, with the open end of the tube sealed against the cavity wall and a steel plug extending throughout the interior thereof; provide coring and inserts for openings communicating with tube openings.
Inject selected molten magnesium alloy into mold cavity; cool mold; and remove mold and coring

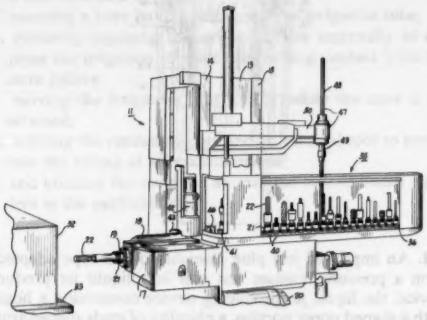
1. A method of making a master brake cylinder for an automobile, comprising:
(a) forming a steel tube having a uniform cylindrical wall closed at one end, the thickness of said wall being in the range of 0.06–0.08 inches, said wall having one or more openings formed at predetermined locations with a hole tolerance of ±0.004 inches and having a smooth interior surface,
(b) working the outer surface of said tube to provide numerous asperities thereon,
(c) forming a mold having a mold cavity adapted to receive said tube with the open mouth of said tube sealed against a die wall, said mold cavity having an inside contour effective to form a brake cylinder body about said tube and particularly to form a continuous enveloping cast wall about said tube, said continuous cast wall having a thickness about twice as thick as the wall of said tube, and
(d) injecting molten magnesium at a temperature of about 1,100° F. into said cavity defined by said mold and tube to fill same, cooling the mold to solidify the magnesium and removing the mold.

4,122,597

TOOL UTILIZATION MECHANISM

Nagle V. Gusching, and Ralph E. Prescott, both of Sidney, Ohio, assignors to The Monarch Machine Tool Company, Sidney, Ohio

Filed May 2, 1977, Ser. No. 792,783
Int. Cl.² B23Q *3/157*
U.S. Cl. 29—568 **17 Claims**



1. In a machine tool having a slide vertically movable on first and second ways on a base and power means connected through a first drive means to an actuation location on the slide to move the slide, the provision of a tool utilization mechanism comprising, in combination,
a tool storage magazine having tool storage sockets adapted to receive different sizes of tools and movable in a path to change the center of gravity of the tool storage magazine,
means mounting said magazine for vertical movement guided by the first and second ways and the weight of said magazine applying a load on the first and second ways which load varies in accordance with the position of said sockets in said magazine,
second drive means connected between the power means and said tool storage magazine to move said tool storage magazine in a vertical direction,
and said second drive means including means to effect vertical movement of said magazine substantially in accordance with the vertical movement of the slide.

4,122,598

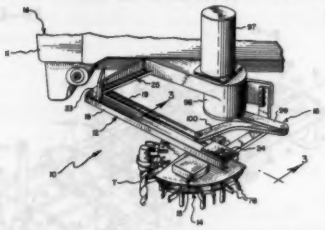
TOOL CHANGER

Frederick E. W. Pegler, Orchard Park, N.Y., and Howard H. Laucks, St. Petersburg, Fla., assignors to Moog Inc., East Aurora, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,120
Int. Cl.² B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**

7. In a tool changer adapted to be mounted on a machine tool having a spindle rotatable about an axis, said tool changer having a frame, a carriage mounted on said frame for movement toward and away from said spindle axis, and a tool storage magazine rotatably supported on said carriage and mounted for movement therewith, the improvement comprising:
carriage moving means operatively arranged to move said carriage between a retracted position remote from said spindle axis, and an extended position adjacent said spindle axis, said carriage moving means including motor means mounted on said frame and having an output shaft

arranged to be rotated between two angular positions, a first arm having one marginal end portion fixed to said output shaft and having a distal marginal end portion, and a second arm having one marginal end portion freely pivotally connected to said first arm distal marginal end



portion and having its other marginal end portion pivotally connected to said carriage,

and rail means continuously guiding said other marginal end portion of said second arm along a path between said retracted and said extended positions from the spindle axis.

4,122,599

ELECTRICAL METER CONNECTING AND DISCONNECTING DEVICE

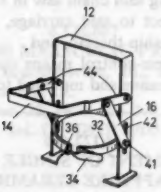
Alexander N. Lunycz, 225½ Annette St., Toronto, Ontario, Canada (M6P 1P9)

Filed Nov. 2, 1977, Ser. No. 847,748

Claims priority, application Canada, Nov. 18, 1976, 266056

Int. Cl.² H05K *13/04*

U.S. Cl. 29—758 **3 Claims**



1. A device for attaching and detaching a meter of the type having a base secured to a glass enclosure and to at least one prong for insertion into a socket provided in a meter base, said meter base having a rim provided with a flange spaced apart from said meter base, said device comprising: a stabilizing member for contacting said meter base and having a pad for accommodation in the space between said flange and said meter base; clamping means slideably connected to said stabilizing member for releasably engaging said glass enclosure; a handle pivotally connected to said stabilizing member; and link means pivotally connected to said clamping means and to said handle for causing the clamping means to slide relative to said stabilizing member upon pivotal movement of the handle whereby said meter prong is caused to move selectively into and out of said socket.

4,122,600

INJECTOR RAZOR ADAPTER

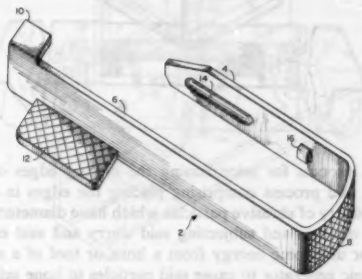
Roger L. Perry, Lynnfield Center, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jul. 19, 1977, Ser. No. 816,934

Int. Cl.² B26B *21/40*

U.S. Cl. 30—90 **2 Claims**

1. An adapter for injector razors comprising a one-piece tool including a bayonet portion adapted for insertion into a head portion of an injector razor, an elongated level portion comprising a substantially planar portion extending in a plane generally parallel to a plane of said bayonet portion but removed therefrom, an end portion interconnecting said bayonet portion and said lever portion, said bayonet portion, said lever portion and said end portion being cooperatively of a U-configuration edge-wise, said lever portion including tab means disposed at a free end of said lever portion and extending generally normally of said lever portion and towards said plane



of said bayonet portion from an edge of said lever portion, said tab means being operable to engage a platform portion of said razor to urge said platform portion to a position separated from a cap portion of said razor, and pusher means comprising a projection extending from said lever portion in a direction opposite from said bayonet portion and having a surface generally normal to said plane of said lever portion, whereby said pusher means may be manipulated by an operator to cause said tab means to urge said platform portion to said position separated from said cap portion.

4,122,601

PORTABLE SEPARABLE GRASS AND BUSH CUTTER

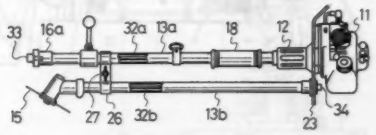
Kazunari Katsuya, Okayama, Japan, assignor to Kaaz Machinery Co., Ltd., Okayama, Japan

Filed Feb. 7, 1977, Ser. No. 765,914

Claims priority, application Japan, Feb. 6, 1976, 51-13116[U]; May 29, 1976, 51-69032[U]

Int. Cl.² B26B *25/00*; B27B *9/00*

U.S. Cl. 30—296 A **8 Claims**

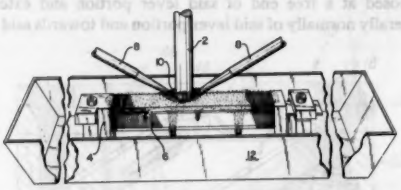


1. A portable grass and bush cutter comprising an elongated main pipe, a power source provided at one end of the main pipe, a cutting means provided at the other end of the main pipe and a main shaft housed within said pipe for transferring power from said power source to said cutting means, said portable grass and bush cutter characterized in that said main pipe together with said main shaft is arranged and configured to be separated into at least two pieces and is provided with a means for coupling together the sections of the main pipe and for coupling together the sections of the main shaft and a means for supporting parallel disposed disassembled sections of said bush cutter fixed to said cutter adjacent said power source and adjacent an end of a section of said main pipe.

4,122,602
PROCESSES FOR TREATING CUTTING EDGES

Suri A. Sastri, Stow, and Steve S. Hahn, Wellesley, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Jun. 3, 1977, Ser. No. 803,290
Int. Cl.[2] B26B *21/54*
U.S. Cl. 30—346.5 20 Claims

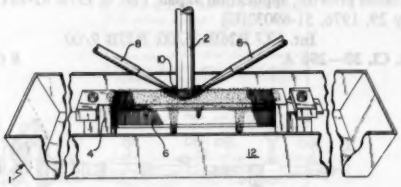


1. A process for microhoning the cutting edges of razor blades, said process comprising placing the edges in contact with a slurry of abrasive particles which have diameters of less than 3 microns and subjecting said slurry and said edges to sonic or ultrasonic energy from a horn or tool of a sonic or ultrasonic generator to cause said particles to hone said edges subjecting the edges to sonic or ultrasonic energy from the horn or too of a sonic or ultrasonic generator while said edges are in contact with a slurry of abrasive particles which have diameters of less than 3 microns.

4,122,603
PROCESSES FOR TREATING CUTTING EDGES

Suri A. Sastri, Stow, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Jun. 3, 1977, Ser. No. 803,299
Int. Cl.[2] B26B *21/54*
U.S. Cl. 30—346.5 6 Claims

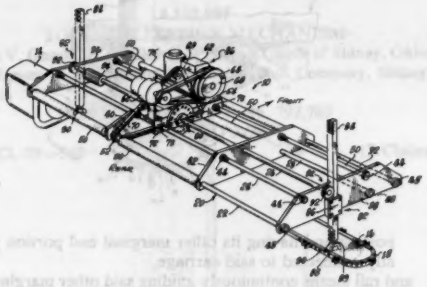


1. A process for microhoning the cutting edges of razor blades, said process comprising subjecting the edges to sonic or ultrasonic energy from the tool or horn of a sonic or ultrasonic generator while said edges are in contact with a slurry of abrasive particles which have diameters of less then 3 microns, said blades being stacked in a magazine with said cutting edges parallel to one another and the flat surfaces of said blades being in face-to-face relationship, said magazine and said horn which supplies said sonic or ultrasonic energy passing one another, the end of said horn having a corrugated surface comprising a plurality of ridges and valleys and orienting said horn so that the length of said ridges will be perpendicular to the length of said edges as said blades and said horn pass one another.

4,122,604
LUMBER FORMING ATTACHMENT FOR CHAIN SAWS

Arnold E. Brown, West Point, Calif. 95255

Filed Nov. 4, 1977, Ser. No. 848,766
Int. Cl.[2] B27B *27/02, 27/10*
U.S. Cl. 30—371 6 Claims



1. A lumber-forming attachment for chain saws adapted to make a longitudinal cut in a log, the chain saw including a saw chain, a chain blade, and a motor to operate said saw chain thereon, said attachment comprising:

an elongated carriage having a structural frame to be transversely supported across the longitudinal axis of said log;

drive means mounted as part of said structural means engageable with said log for longitudinal movement along the length of said log;

power means operably connected to said drive means to power said drive means independently of said chain saw;

guide means mounted on said carriage and positioned rearward of said drive means;

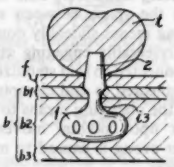
means for adjusting said chain saw in a predetermined position with respect to said carriage, and in a horizontal parallel relationship thereto; and

a selective-thickness-control means operably connected to said adjusting means and mounted to said carriage.

4,122,605
SOMATIC ELEMENT OF SINGLE CRYSTALLINE SAPPHIRE CERAMICS

Masaya Hirabayashi, Yokaichi; Haruyuki Kawahara, Moriguchi, and Yoshio Taniguchi, Gamo, all of Japan, assignors to Kyoto Ceramic Kabushiki Kaisha, Kyoto, Japan

Filed Sep. 22, 1976, Ser. No. 725,511
Int. Cl.[2] A61C *8/00*
U.S. Cl. 32—10 A 9 Claims



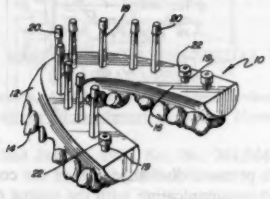
1. A somatic element for use as an implant in bone tissue and having good affinity with said bone tissue, said element comprising a single crystalline sapphire ceramic element having a bending strength of from about 9,000 to 20,000 kg/cm^2, said element being shaped into a desired implant configuration by cutting and working said element and further being smoothed by polishing such that said element is rendered substantially free from sharp edges and scars created by said cutting and working.

4,122,606

METHOD AND APPARATUS FOR MOUNTING DENTAL DIE MODELS IN DENTAL STONE

Richard C. Roman, 230 Westmoreland Dr., Vernon Hills, Ill. 60060

Filed Jul. 26, 1976, Ser. No. 708,641
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—11 15 Claims



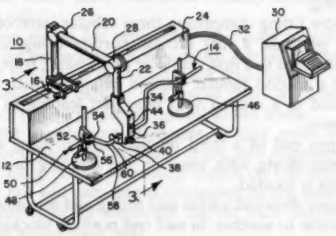
1. The method which comprises filling a flexible tray having sides with uncured, fluid dental stone, to provide a mass of dental stone of predetermined depth; inserting the outer ends of dowel pins carried by a die model into said stone while still in fluid condition, to bring the die model into contact with the surface of said dental stone; at least one of said dowel pins inserted into said dental model being covered with a colored indicating and spacing member; allowing said dental stone to harden; and flexing said flexible tray to remove the dental stone and the die model from it.

4,122,607

INSTRUMENT FOR MEASURING PREFORMED TUBES

Werner G. Hopf, Carpentersville, Ill., assignor to Teledyne Industries, Inc., Aurora, Ill.

Filed Dec. 22, 1976, Ser. No. 753,603
Int. Cl.[2] G01B *5/00*
U.S. Cl. 33—174 L 17 Claims



1. In an apparatus for measuring a location of a point along a straight portion of a preformed tube or pipe, said apparatus including means for mounting the tube or pipe in a known position, a member defining a first axis, means for positioning said member with respect to said tube, and means for sensing the position of said member, the improvement comprising:

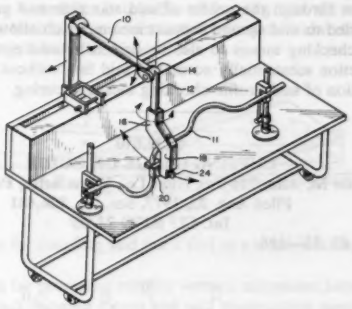
tube feeler means mounted on said member and having surfaces shaped and positioned to engage opposite sides of the tube, said tube feeler means defining a second axis which intersects a projection of said first axis to form an intersection therewith, wherein said intersection lies at the centerline of the tube when said surfaces engage said opposite sides of said tube.

4,122,608

TUBE FEELER

Werner G. Hopf, Carpentersville, Ill., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 22, 1977, Ser. No. 790,053
Int. Cl.[2] G01B *7/00*
U.S. Cl. 33—174 L 21 Claims



6. In an apparatus for measuring the location of points along the straight portions of a preformed tube or pipe, said apparatus having a tube feeler defining a first and a second axis wherein projections of the first and second axes intersect, and means for positioning said tube feeler such that said intersection is positioned on the centerline of the tube, thereby acquiring each point to be measured, the improvement comprising: said tube feeler having

a base coupled to said means for positioning said tube feeler;

a pair of plates having facing tube-engaging surfaces; and

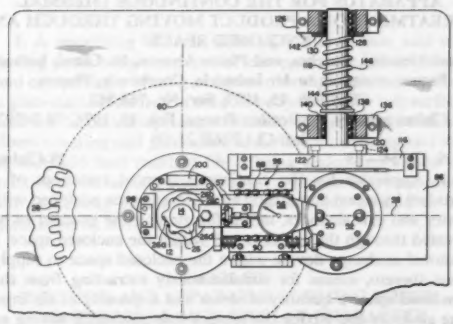
means mounting said plates on said base for movement toward and away from each other to bring said tube-engaging surfaces into contact with opposite sides of said tube so that the engagement of said surfaces with the tube positions the intersection of the axes on the centerline of the tube.

4,122,609

MACHINE FOR TRACING THE PROFILE OF AN ORBITING STAR GEAR

Henry J. Flair, Franklin Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 5, 1977, Ser. No. 793,976
Int. Cl.[2] B23F *23/08;* B24B *5/26;* B23F *5/27*
U.S. Cl. 33—174 P 6 Claims



1. A machine for checking the profile of an ideal orbiting star gear which comprises a predetermined number of teeth comprising first support means for supporting said star gear, first rotational drive means for rotating said first support means and said star gear at a predetermined angular velocity, profile

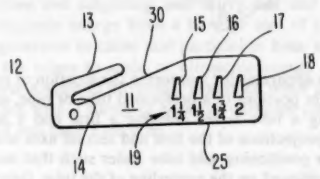
checking means positioned adjacent said star gear, second support means for supporting said profile checking means, an eccentric second rotational drive means coupled to said eccentric for rotating said eccentric at an angular velocity that is substantially equal to the angular velocity of said star gear multiplied by said number of teeth, said eccentric being coupled to said second support means in a manner so that it drives said profile checking means back and forth along a line that passes through the center of said star gear and guide means coupled to said second support means which allows said profile checking means to also be driven by said eccentric in a direction substantially normal to said line without substantial rotation of said profile checking means occuring.

4,122,610

CUTTING GAUGE OR GUIDE

Lolotte M. Allo, 714 Fox Hunt La., Warminster, Pa. 18974

Filed Aug. 22, 1977, Ser. No. 826,431
Int. Cl.[2] B27G *23/00*
U.S. Cl. 33—186 **3 Claims**



1. A unitary cutting guide for use with a pair of shears, said guide comprising a unitary piece of material having a generally elongated shape defining first and second opposite faces, each of said faces having a first dimension substantially larger than a second perpendicular dimension, guide means adjacent one shorter dimensioned edge of said material, said guide means including a first inner surface extending between said faces in a direction parallel to said one shorter dimensioned edge and a first pair of inner surfaces extending between said faces of an angle to said one shorter dimensioned edge to define a slot having an opening adjacent one larger dimensioned edge of said material in which cloth can be received, a series of spaced apart openings extending between said faces in which one blade of a pair of shears can be received, each of such openings being at a predetermined spaced apart distance from said first inner surface.

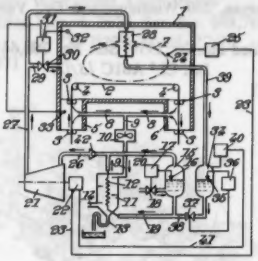
4,122,611

APPARATUS FOR THE CONTINUOUS THERMAL TREATMENT OF A PRODUCT MOVING THROUGH AN ENCLOSED SPACE

Paul Marchal, Garches, and Pierre Alvarez, St. Cloud, both of France, assignors to Air Industrie, Courbevoie, France

Filed Feb. 15, 1977, Ser. No. 768,862
Claims priority, application France, Feb. 19, 1976, 76 04597
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—73 **28 Claims**

1. Apparatus for the continuous thermal treatment of a product by steam comprising an enclosed space equipped with entry and exit air-locks, means for guiding the product to be treated through the air-locks and within the enclosed space, a thermal exchange device within the enclosed space to supply heat thereto, means for simultaneously extracting from the enclosed space a quantity of steam and a quantity of air from the air-locks and mixing the same, a first condensor having an inlet communicating with said extraction means to receive and condense said mixture, an evaporator associated with said first condensor having an entry port connected to a source of water and a vapor outlet port, a compressor having a low pressure entry port communicating with the vapor outlet of said evaporator and a high pressure discharge port; and, said thermal exchange means comprising a second condensor mounted within the enclosed space having an entry port communicating



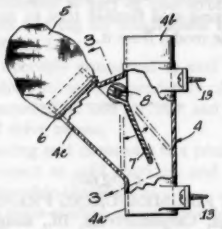
with the high pressure discharge port of the compressor, and an outlet port communicating with the source of water.

4,122,612

ENERGY SAVING DEVICE UTILIZING NORMALLY WASTED HEAT FROM CLOTHES DRYERS

John J. Mrofchak, 418 Willard NE., Warren, Ohio 44483

Filed Sep. 2, 1976, Ser. No. 719,734
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—86 **1 Claim**



1. For use with a conventional clothes dryer having a heat source and a high capacity fan for driving heated air through the clothes to be dried, and a vent pipe for venting heated, moist air from said dryer to the atmosphere, the improvement comprising:

a hollow fitting comprising three tubular intercommunicating portions, a first tubular portion being adapted for connection to a first vent pipe part leading from the dryer, and a second tubular portion being adapted to be connected to a second vent pipe part leading to the atmosphere,

the open end of a third tubular portion being adapted to communicate with space in the building in which said dryer is located,

a damper disposed within said fitting and movable from one position to another, in said one position blocking air flow from said first tubular portion through said second tubular portion while permitting such air flow to exhaust through said third tubular portion and to said building space, and in said other damper position blocking air flow from said first tubular portion through said third tubular portion while permitting such air flow to exhaust through said second tubular portion and to the atmosphere,

said damper being fixed to a shaft, the opposite ends of the latter being journalled within openings in said fitting and extdnding outwardly of said fitting, one shaft end having a manually manipulatable knob fixed there to and the other shaft end having a disc secured thereto, a face of said disc facing an exterior surface of said fitting and said face and surface having interengagable abutments for holding said damper in any one of a number of adjusted positions,

a compression spring surrounding said shaft one end and disposed between said knob and an exterior surface of said fitting, said spring being operable to releasably hold said abutments in engagement, and

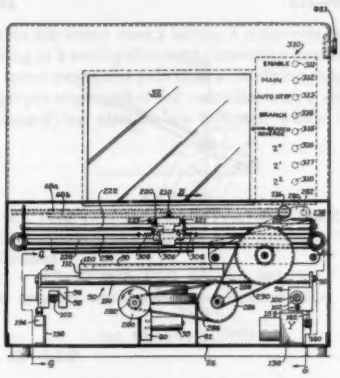
a bag-like filter having an inlet mouth portion disposed closely over the open end of said third tubular portion and detachably secured thereto, said filter preventing lint and the like from said clothes dryer from entering said building space.

4,122,613

OPERATOR RESPONSIVE AUDIO-VISUAL TEACHING APPARATUS

George C. Karalus, Arlington Heights, and Robert R. Parker, Wheeling, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 24, 1977, Ser. No. 761,566
Int. Cl.[2] G09B *3/00*
U.S. Cl. 35—9 A 46 Claims



3. An audio visual teaching device, comprising:

a frame having a projection screen mounted thereon;

a storage element including a visual record portion and an optical sound track portion representing audio information;

a guide rail secured to said frame;

an optical sound track transducer slidably mounted on said guide rail;

projection means for projecting the visual record portion onto the projection screen and for projecting the optical sound track onto the sound track transducer;

drive means for moving said sound track transducer with respect to said projected optical sound track;

means for maintaining alignment of said guide rail with respect to said optical sound track, said alignment means comprising pivotal mounting means on one end of said guide rail and cam means connected to the other end of said guide rail for alignment thereof with respect to said optical sound track; and

an audio amplifier connected to said sound track transducer for reproducing audio information.

4,122,614

NORDIC SKI TRACK SLED

Stanley O. Cheney, Rte. 114 North, Bradford, N.H. 03221

Filed Mar. 28, 1977, Ser. No. 781,541
Int. Cl.[2] E01H *4/00*
U.S. Cl. 37—10 15 Claims

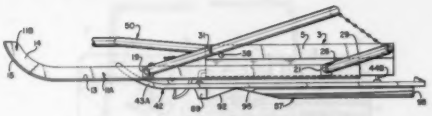
1. A track sled comprising:

(1) a frame;

(2) transporting means attached to said frame for transporting said track sled through snow along a selected ski path;

(3) track-forming means for forming two parallel ski tracks of predetermined character along said ski path, wherein said track-forming means comprises two substantially identical tracking-forming assemblies mounted parallel to one another;

(4) means for attaching said track-forming assemblies to said frame so that each of said track-forming assemblies is capable of rotating freely about an axis which extends longitudinally of said frame, whereby each of said track-forming assemblies is capable of forming said ski tracks with a bottom plane substantially perpendicular to the earth's gravitational force;



(5) means for coupling said track sled to a suitable transport; and

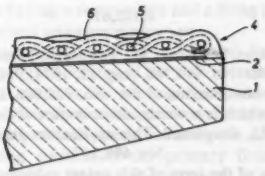
(6) means for providing relative vertical movement between said track-forming means and said transporting means so as to alternately (a) elevate said track-forming means above said transporting means so that said sled can be transported through snow without forming said ski track, and (b) lower said track-forming means in position to form a ski track as the sled is transported along a ski path.

4,122,615

SMOOTHING IRON SOLE

Erich R. Baumgartner, Tiroler Platz 4, and Peter Doehler, Kaulbachstr. 59, both of Munich, Fed. Rep. of Germany (8000)

Filed Apr. 11, 1977, Ser. No. 786,695
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1976, 2616286
Int. Cl.[2] D06F *75/38*
U.S. Cl. 38—93 7 Claims



1. A smoothing iron sole defining a sole surface, said sole having a sole body comprised at least partly of a glass material, and comprising a heating conductor arrangement mounted on a glass-material surface of the sole body facing the sole surface, said sole further comprising a thin fabric layer of heat-resistant fibers covering said glass-material surface for defining said sole surface said heat resistant fibers being sealed and closed off relative to the heating conductor arrangement by a heat-resistant connecting material which is also firmly bonded to the glass material surface.

4,122,616

METHOD AND APPARATUS FORMING THREE DIMENSIONAL SIGN DISPLAY CHARACTER

Frank A. Witt, Lexington, S.C., assignor to Colite Industries, Inc., West Columbia, S.C.

Filed Jun. 28, 1976, Ser. No. 700,218
Int. Cl.[2] G09F *1/00*
U.S. Cl. 40—596 18 Claims

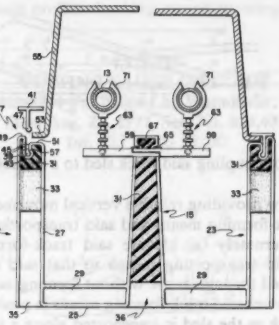
1. A sign character element having the shape of a character,

symbol or the like, for receiving a display sign face, comprising:

base structure means thinly molded from a plastic type material and including means forming a hollow wall member circumscribing the shape of a character, said wall member means having top side, inside and outside walls forming the hollow within said wall member means;

first means, including a configuration formed in said wall member means in the area of said top-side wall;

flexible means disposed within the hollow of said wall member means in the area of said formed configuration, said



flexible means compressible within the hollow for providing an expansive force against said thin configured wall member means when said flexible means is compressed by a force applied to said configuration; and

second means cooperable with said configuration for retainable coupling with said wall member means, said second means contacting said configuration during coupling for compressing said flexible means to provide said expansive force to frictional retain said second means to said wall member means, said second means cooperable with a sign face for securement thereof with respect to said structure means when coupling of said first and said second means.

4,122,617

PICTURE FRAME

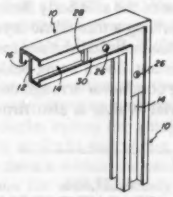
Helmar Nielsen, 365 Main St., Townsend, Mass. 01469

Division of Ser. No. 496,746, Aug. 12, 1974, Pat. No. 3,965,601, which is a continuation of Ser. No. 422,900, Dec. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 217,915, Jan. 14, 1972, abandoned. This application Jun. 24, 1976, Ser. No. 699,267

The portion of the term of this patent subsequent to Jun. 28, 1993, has been disclaimed.

Int. Cl.[2] G09F *1/12*

U.S. Cl. 40—155 **15 Claims**



1. In a picture frame formed from frame sections, each of said frame sections having a rearwardly facing channel which terminates in inwardly extending lips, an improved means for securing an adjacent pair of said sections together at a corner junction comprising:

a bracket having a pair of legs disposed at an angle substantially identical to the angle made by said frame sections at said corner junction, said legs being adapted to fit within the rearwardly facing channels of adjacent frame sections at said corner junction, said legs being of a width which is greater than the rearwardly facing opening defined by said lips of said rearwardly facing channels thereby to retain said bracket within said channels; and

locking means for urging said bracket away from the bottom of said channels and toward and against said lips, said bracket and said lips of said adjacent frame sections being constructed and arranged to cause relative pivotal movement between each said frame section and the bracket leg engaged therewith along the longitudinal axes thereof in response to said urging by said locking means.

4,122,618

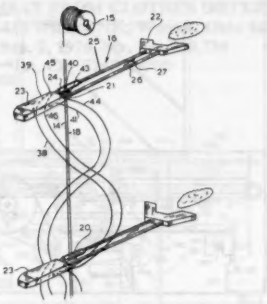
SKYWRITING APPARATUS

Gerald A. Gay, 1900 Alden Rd., Orlando, Fla. 32803

Filed May 31, 1977, Ser. No. 801,635

Int. Cl.[2] G09F *19/00*

U.S. Cl. 40—213 **22 Claims**



1. A skywriting apparatus comprising in combination:

an airplane;

a winch attached to said airplane;

a support cable supported from said winch and adapted to be lifted by said winch and to be lowered by said winch;

a plurality of vapor generating units for generating visible vapor on command;

each said vapor generating unit being attached to said support cable in a spaced relationship to each other once the cable is extended and to be drawn together when such cable is raised; and

a spacer cable operatively connecting each said vapor generator together at predetermined spaced positions along said spacer cable and support cable whereby said support cable can raise and lower said vapor generators and said spacer cable can maintain the vapor generator spaced when said support cable is lowered.

4,122,619

MICROFILM-UNIT AND MAGNIFYING-GLASS LOCKET

Bernard M. Kruger, West Caldwell, N.J., assignor to Arnold Herman, Warren, N.J.

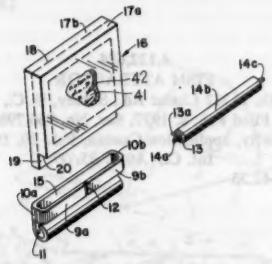
Filed Sep. 20, 1977, Ser. No. 834,898

Int. Cl.[2] G09F *11/30*

U.S. Cl. 40—365 **7 Claims**

1. A microfilm-locket device comprising in combination: a portable fold-down locket adapted for transporting microfilm mounted therein including a mounting-base structure, and including fold-down magnifying glass means adapted for optically viewing in magnification a microfilm mounted by the locket means, as a unit; the improvement comprising a microfilm encased within transparent plastic casing, and holder means mounted on the mounting-base for retainable-insertion

of and supporting of the transparent plastic casing in a state and position viewable of the microfilm therein, adapted such that microfilm is protected and disposable, and said film and forward and rearward walls of the plastic casing extending in substantially parallel planes, and said casing including a step at its base, stepping from a smaller thickness of the step mountable within the frame means having a transverse wall of the step serving as a seating-abutment preventing further insertion into the frame means and providing a stabilizing support maintaining proper alignment of the microfilm with a viewing axis of the magnifying glass, when mounted within the frame means.



4,122,620

DEVICE FOR USE IN DEACTIVATING FIREARMS

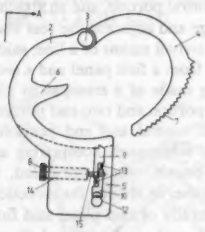
Clifton J. Alexander, 14A Caffray Ave., Aramoho, Wanganui, New Zealand

Filed Jun. 6, 1977, Ser. No. 803,757

Claims priority, application New Zealand, Jun. 17, 1976, 181190

Int. Cl.² F41C *27/00*

U.S. Cl. 42—1 LP **10 Claims**



1. A device for securing a firearm comprising:

a first member which includes a projecting portion,

a second member hingeably associated with said first member and capable of having a free end thereof moved towards or away from said first member so that when moved away a firearm can be positioned between the two members and when moved together such a firearm is encircled, each of the said members including locking means to facilitate the locking of said members together so as to hold them in an encircling relationship with a firearm positioned therebetween, the construction and arrangement being such that when the firearm is thus located between said members said projecting portion interferes with the operation of the firearm, said first and second members being mutually lockable together whereby said members can only be separated under the action of a key and wherein a ratchet engagement is provided between said first and second members so that when they are being locked together the position of each member can be adjusted to more accurately encircle the firearm in question, the ratchet engagement being such as to allow tightening of the two members around a firearm and not to allow the release of the same unless the locking means by which two members are mutually lockable is released.

4,122,621

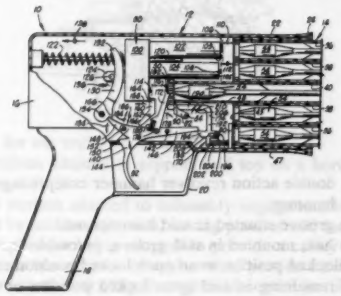
UNDERWATER REPEATING SPEAR GUN

W. Lincoln Barr, 314 S. 9th, Kingfisher, Okla. 73750

Filed Jul. 14, 1977, Ser. No. 815,668

Int. Cl.² F41C *3/00*; F41F *1/00*

U.S. Cl. 42—1 L **12 Claims**



1. A repeating spear gun for launching self-propelled spears, comprising:

a breech; a magazine connected to the breech in an assembled mode of the speargun and comprising:

a primary firing chamber containing a spear in a loaded condition thereof, said spear retainingly positionable at a launching position in the primary firing chamber; and

an auxiliary firing chamber containing a spear in a loaded condition thereof, said spear retainingly positionable at a launching position in the auxiliary firing chamber;

a bolt supported by the breech for movement toward the magazine and having a rest position and a firing position, the bolt characterized as comprising:

a primary firing pin mounted on the bolt and disposed to be positionable by movement of the bolt in striking engagement with a spear in the primary firing chamber in the loaded condition thereof, the primary firing pin disposed by the bolt a predetermined first firing pin distance from the launching position of the primary firing chamber when the bolt is in the rest position; and

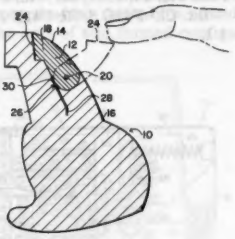
an auxiliary firing pin mounted on the bolt and disposed to be positionable by the movement of the bolt in striking engagement with a spear in the auxiliary firing chamber in the loaded condition thereof, the auxiliary firing pin disposed by the bolt a predetermined second firing pin distance from the launching position of the auxiliary firing chamber when the bolt is in the rest position; and

biasing means supported by the breech for forcefully urging the bolt toward the magazine along the firing path when the bolt is moved to the firing position and released therefrom, the first firing pin distance being greater than the second firing pin distance so that the primary firing pin is caused to strike and fire a spear in the primary firing chamber in the loaded condition thereof whereupon spear propulsion gases and spear impact absorb the movement of the biasing means to prevent simultaneous firing impact of the auxiliary firing pin with a spear in the auxiliary firing chamber, and so that the auxiliary firing pin is caused to strike and fire a spear in the auxiliary firing chamber in the loaded condition thereof when no spear is in the primary firing chamber.

4,122,622
DOUBLE ACTION REVOLVER HAMMER

Ralph J. Angelino, Box 173, 16 Leets Island Rd., Bramford, Conn. 06405

Filed Jan. 5, 1977, Ser. No. 756,769
Int. Cl.² F41C *19/00*
U.S. Cl. 42—65 10 Claims

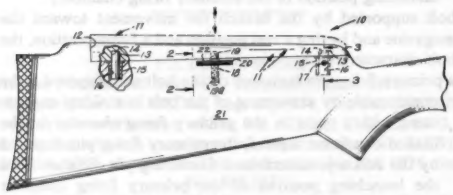


1. A double action revolver hammer comprising:
(a) a hammer,
(b) a groove situated in said hammer, and
(c) a link, mounted in said groove, pivotable from a closed unlocked position to an open locked position and capable of remaining in said open locked position or closed unlocked position,
said link, when pivoted to an open locked position, is capable of imparting movement to said hammer to cock a trigger of the revolver.

4,122,623
ADJUSTABLE GUN STOCK

Eldon C. Stice, 5201 Churchill Ave., Las Vegas, Nev. 89107

Filed Sep. 28, 1977, Ser. No. 837,577
Int. Cl.² F41C *23/00*
U.S. Cl. 42—73 1 Claim

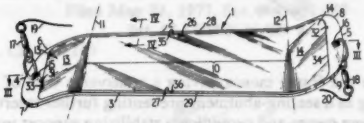


1. An adjustable gun stock, comprising, in combination, a stock and a comb for customizing said gun stock precisely to individual needs of a shooter, a recessed opening on an upper side of said stock, means for adjustably raising or lowering said comb in said opening, a pair of parallel, spaced-apart dowel pins secured to an underside of said comb and protruding downwardly therefrom, a threaded bolt parallel to said dowel pins being located therebetween and also secured within an underside of said comb and protruding downwardly therefrom; a pair of sleeves are each fitted within an opening on a horizontal upper surface of said recessed opening, said sleeves slidably receiving said down pins, a clearance opening in said upper surface of said recessed opening freely receiving said threaded bolt, said clearance opening intercepting a horizontal slot inside said stock between said recess upper surface, and a lower side of said stock, a knurled wheel freely received in said slot and having a threaded central opening thread engaged on said bolt, said wheel protruding outwardly of one side of said stock for accessibility of manual rotation thereof, and each said sleeve having a set screw in a side thereof for locking against a side of said dowel pins, said set screws extending to said stock side for accessibility of manual rotation thereof.

4,122,624
FISH ATTRACTOR

Brian F. Smith, 11332 Chalet Rd., Sidney, B. C., Canada

Filed Feb. 8, 1977, Ser. No. 766,798
Claims priority, application Canada, Feb. 20, 1976, 246179
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.33 3 Claims

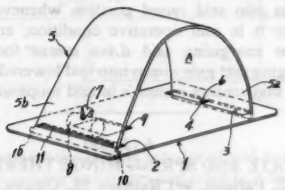


1. Fish attractor of the type of a light-reflective plate-like member having two side edges, a front end edge, a rear end edge and rounded joinder edges between each of said end edges and the respective side edges, said side edges being slightly divergent in the direction from said front end edge towards said rear end edge, said member having a generally planar, central portion whose sides are defined by a substantial portion of the length of each of said side edges, and whose ends are defined by a front bend and by a rear bend, said bends extending laterally of said member and defining joinders between said central portion and generally planar front and rear end portions, respectively, the end portions being inclined at an obtuse angle with respect to said central portion in mutually opposite directions with respect to a plane coincident with the surface of said central portion, and an attachment hole adjacent the front end edge and adjacent the rear end edge for securing said attractor to swivel means of a line; said plate-like member being composed from a first panel and a second panel, each of said panels being made of a transparent plastics material and having a central portion and two end portions generally corresponding to said central and end portions of the plate-like member; each of said panels comprising arresting means for preventing said panels, when assembled, from displacement relative to each other in at least the directions generally longitudinally and laterally of said plate; said first panel being provided in one surface thereof with a shallow, elongated cavity defined by a peripheral wall extending along and adjacent to the outside edges of said first panel, said outside edges of said first panel forming said side and end edges of the plate-like member, whereby a ridge is provided along each side and end edge of said first panel; said second panel having a peripheral edge arranged to closely fit within said cavity whereby said second panel produces a flush continuation of said one surface of the first panel, whereby the peripheral edges of said second panel are located against the respective portions of the peripheral wall of said cavity to form said arresting means, the peripheral edge of said second panel being in a generally abutted relationship with the associated portion of the peripheral wall of said cavity; means for joining the edges of said second panel with said peripheral wall of the cavity in a watertight fashion to produce a joinder seam between said panels, said joinder seam being generally coincident with only one face of said plate member; and a light reflecting sheet means providing a substantial portion of said plate-like member with light reflecting property, said light reflecting sheet means being located within said cavity and being sandwiched between said panels.

4,122,625
TRAP FOR SMALL ANIMALS DOING HARM TO POSSESSIONS

Tomoaki Ohtsuka, 10-22, Misaki 5-chome, Suminoe-ku, Osaka, Japan

Filed May 23, 1977, Ser. No. 799,193
Int. Cl.² A01M 23/24
U.S. Cl. 43—82 10 Claims



1. A trap for small animals doing harm to possessions, comprising a base plate whose one longitudinal end is formed with an elongated opening, an elastic plate whose base end is rotatably supported at the other end of said base plate and whose free end passes through said elongated opening and further extends to the front end side, an engagement projection on said elastic plate near the free end thereof, and an engagement member adapted to be interposed between the upper surface of said base plate and said engagement projection with said elastic plate upwardly curved between its base end and said elongated opening.

4,122,626
TOY GLIDER

John R. Waters, 9221 SE. 55th Ave., Portland, Oreg. 97206

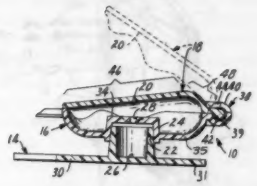
Filed Oct. 4, 1976, Ser. No. 728,934
Int. Cl.² A63H 33/00
U.S. Cl. 46—11 4 Claims

1. A toy glider comprising
(a) a pair of wings having inner and outer ends as well as forward and rearward ends,
(b) the forward ends of said wings having a rounded curvature,
(c) each of said wings being formed from a curved blank of material and having an upwardly arched configuration provided by the curve of the blank material,
(d) said curved blank of material comprising a container which is tapered so as to form wings of reduced radius toward the forward end,
(e) said wings being formed of a material having sufficient rigidity to be self-sustaining in said arched configuration,
(f) means connecting said wings together at their inner ends to form a body portion,
(g) and weight means secured to the body portion at the forward end of said wings.

4,122,627
UNDERWATER TOY OPERATED BY CHEMICALLY PRODUCED GAS BUBBLES

James F. Kubiatowicz, Minneapolis, Minn., assignor to Custom Concepts, Incorporated, Minneapolis, Minn.

Filed Feb. 25, 1977, Ser. No. 772,300
Int. Cl.² A63H 23/10
U.S. Cl. 46—92 9 Claims



1. A toy for use under water comprising:
a base portion adapted to support said toy on a horizontal surface;
a central portion adapted to releasably engage and be supported by said base portion, mating parts of said base and central portions being adapted to provide a cavity therebetween and said part of said central portion having an aperture communicating through said central portion;
a cover portion having a generally concave surface; and
means adapted to mount said cover portion on said base portion for pivotable movement about an axis between a closed position with said concave surface adjacent said central portion over said aperture, and an open position with said concave surface spaced further from said aperture;
said generally concave surface comprising a part which is generally trough-like about an axis which is generally normal to the axis of pivoting for said cover portion, and a domed part adjacent the axis of pivoting for said cover portion which domed part smoothly joins the trough-like part, the axis of said trough-like part being inclined upwardly toward said domed part when said cover portion is in said closed position and being inclined upwardly away from said domed part when said cover portion is in said open position so that, with the assembled toy submerged in water with said base supported on a horizontal suface, gas bubbles produced by the combination of water and chemicals in said cavity will move through said aperture along said trough-like part and will be retained under the domed part of said concave surface until the buoyancy of the gas moves said cover portion to said open position at which the gas will move along said trough-like part and be released from under said cover portion.

4,122,628
THREE DIMENSIONAL DOLL

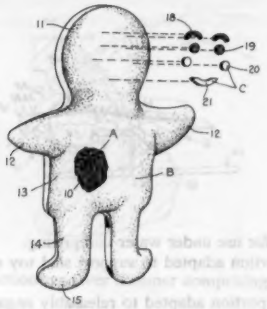
Florence S. Crowell, Box 125, Lake Toxaway, N.C. 28747, and Janice R. Hicks, Rte. 2, Box 20A, Lake Toxaway, N.C. 28749

Filed Sep. 10, 1976, Ser. No. 722,279
Int. Cl.² A63H 3/06, 3/44
U.S. Cl. 46—135 R 1 Claim

1. A doll for which a vaiety of facial features and clothes can be readily changed in a variety of selectable positions for developing and promoting creative skills in children, comprising:
a three dimensional figure of stuffing material including a cover member containing said stuffing material and presenting a looped surface extending smoothly across and covering said three dimensional figure;
a variety of changeable facial feature accessories and a variety of changeable clothing accessories;
hook members carried on a back side of said accessories so

that said accessories can be readily secured to said loop surface of said three dimensional figure; and

said facial feature accessories and said clothing accessories being removably positionable upon said three dimensional figure by placement of said hook members upon any portion of said cover member;



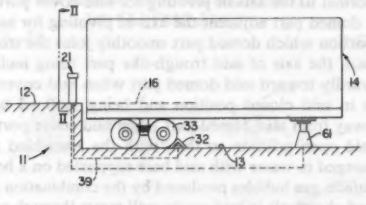
whereby a child's creative skills are developed and promoted by allowing readily changing of the facial features and clothes of the doll on any desired location of said three dimensional figure selected by the child.

4,122,629

DOCK SAFETY APPARATUS

Virgil G. Rennick, 2367 Miller Hwy., Olivet, Mich. 49076

Filed Jan. 24, 1977, Ser. No. 761,588
Int. Cl.² E05F *11/00*
U.S. Cl. 49—357 **13 Claims**



1. A safety device for use with a loading dock having a substantially horizontal loading platform terminating adjacent a truck parking area which is at an elevation below said platform so that a truck positioned within said parking area has the bed thereof and the loading platform at similar elevations, said safety apparatus comprising:

a stationary frame structure adapted to be fixedly related with respect to said loading dock;

an elongated cantilevered gate swingably movable supported on said frame structure for swinging movement between a raised substantially upright position and a lowered substantially horizontal position, said gate when in said lowered position extending along the loading dock in a direction approximately parallel with the edge thereof and being spaced upwardly above the loading platform, said gate when in said lowered position also being positioned adjacent said edge and extending at least partially across that portion of the loading platform which provides direct access to the parking area;

drive means interconnected to said gate for causing selective swinging movement thereof between said raised and lowered positions;

sensing means associated with said parking area for sensing the presence of a stationarily positioned truck within said parking area in close proximity to said loading dock, said sensing means being maintained in an operative condition so long as it senses the presence of a stationary truck within said parking area in close proximity to said loading dock, said sensing means being maintained in an inoperative condition so long as it does not sense the presence of a stationary truck within said parking area in close proximity to said loading dock; and

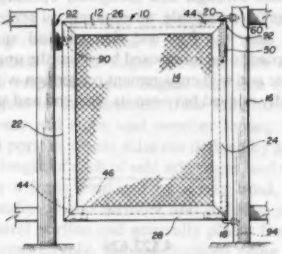
control means responsive to said sensing means for causing energization of said drive means, said control means energizing said drive means to effect swinging of said gate means into said raised position whenever said sensing means is in said operative condition, and said control means energizing said drive means for automatically swinging said gate means into said lowered position whenever said sensing means is in said inoperative condition.

4,122,630

GATE AND SPRING HINGE THEREFORE

Rudolph E. Parisien, 891 Rainbow St., Ottawa, Canada

Filed Nov. 9, 1976, Ser. No. 740,230
Claims priority, application Canada, Dec. 1, 1975, 240806
Int. Cl.² E05F *1/10, 1/12*
U.S. Cl. 49—386 **1 Claim**



1. In combination, a gate, including a frame, and a spring hinge for said gate, said frame including channel members of rectangular cross section secured together by right angle corner keys, said spring hinge comprising a rod having a right angle bend one end of said rod being threaded for engagement with a gate post, an opposite end of said rod having a slot therein and passing through an aperture in a corner key of said gate and a helical spring surrounding said opposite end of said rod so that one end of said helical spring is anchored in said slot and an opposite end of said helical spring engages a wall of said channel member of said gate so that opening said gate in one direction will cause said spring to be twisted thereby storing energy to return said gate to a closed position, whereas the opening of said gate in the opposite direction will not cause said spring to engage, and wherein said spring hinge is constructed and arranged within said gate frame to prevent detachment from said gate frame while the gate is in the closed position.

4,122,631

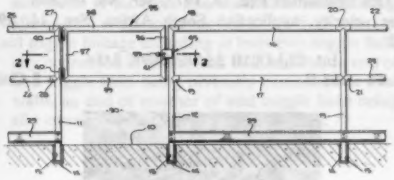
PIPE RAIL AND GATE CONSTRUCTION

Roy W. Batcheller, South El Monte, Calif., assignor to Crane-Veyor Corporation, South El Monte, Calif.

Filed Jun. 27, 1977, Ser. No. 810,309
Int. Cl.² E05B *65/06*
U.S. Cl. 49—394 **9 Claims**

1. In a gate construction comprising a frame for a doorway including a cylindrical tubular post, a gate structure swingably mounted on said frame comprising a vertical tubular member on the side adjacent said post, and a latch assembly for the gate structure on the side adjacent said post, said latch assembly comprising a stop member and a latch bolt, said stop member comprising an anchor plate having an extruded arcuate shaped surface corresponding to the arcuate exterior of the respective

tubular member and a stop plate extending tangentially from said anchor plate and outwardly relative to the gate structure, fastening means acting between the anchor plate and the corresponding tubular member for holding the stop member in place, means forming holes respectively in said tubular member and said post with the arcuate exterior of said post adjacent the hole therein serving as a strike, said latch bolt being spring actuated and extending slidably through the hole in the tubular member and adapted to extend into the hole in the adjacent post for holding the gate in closed position.

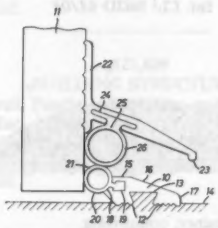


4,122,632

DRAUGHT AND WEATHER SEALING ARRANGEMENTS

Bernard Dixon, Pampisford, England, assignor to Dixon International Limited, Pampisford, England

Filed Mar. 11, 1977, Ser. No. 776,611
Claims priority, application United Kingdom, Mar. 11, 1976, 9757/76
Int. Cl.[2] E06B 1/70
U.S. Cl. 49—470 15 Claims



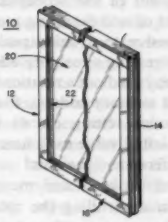
1. In a sealing arrangement,
a door mounted for hinging movement,
a sill,
a weatherboard carried by said door,
an elongate seal supported along said weatherboard, said seal having a resiliently supporting protruding portion for sealing a gap between said weatherboard and said sill when said door is in a closed position,
a rib provided on said sill, the rib being an elastomeric element retained by the sill, and extending along the sill and protruding therefrom, the rib further being arranged at the rear of the sill and sealing against the door when the door is in the closed condition,
said protruding seal portion, during hinging movement of said door from the closed condition to the open condition, passing through an intermediate condition in which the seal portion traverses the rib in contact therewith so that the whole length of the seal portion is wiped by the rib.

4,122,633

METHOD OF CLADDING A WINDOW PRODUCT

Joe W. Holdiman, Champaign, Ill., assignor to Scovill Manufacturing Company, Dubuque, Iowa

Filed Jan. 12, 1977, Ser. No. 763,910
Int. Cl.[2] E06B 3/00
U.S. Cl. 49—501 7 Claims



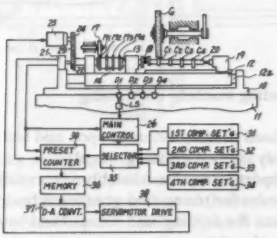
1. A window product having a metal cladding applied to selected portions thereof comprising:
a first elongated milled element having a front and a rear face and an outwardly opening rabbet located on a side between the front and the rear faces thereof, said rabbet adapted to receive a glazing panel assembly traversing the first milled element therefor from a first end to a second end, the first end and the second end thereof adapted to receive a second milled element to form a miterless joint, a metal cladding covering said front side and extending into the rabbet, said cladding folded at each of the first and second ends thereof for retaining the cladding in engagement with the first milled element therefor.

4,122,634

CAM GRINDING MACHINE

Hideo Nishimura, Nagoya, and Kuniyuki Niwa, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 23, 1977, Ser. No. 835,919
Claims priority, application Japan, Sep. 23, 1976, 51-114081
Int. Cl.[2] B24B 5/42, 17/10
U.S. Cl. 51—165.71 2 Claims



1. In a cam grinding machine having a bed, a slide table slidably mounted upon said bed, a swing table swingably journalled upon said slide table, means mounted upon said swing table and including a rotatable spindle for rotatably supporting a workpiece to be ground, a master cam mounted on said spindle and rotated synchronously with the workpiece, a follower roller adapted to be held in contact with said master cam, and drive means for rotating said master cam and the workpiece synchronously in order to generate a cam profile on the workpiece in cooperation with a grinding wheel, the improvement comprising:
a servomotor in said drive means;
memory means for storing at memory addresses thereof data

of rotational speeds of the workpiece corresponding to angular positions of the workpiece;

detecting means for generating a unit signal each time the workpiece is rotated a unit angle and a reference signal at a reference detecting point thereof;

a compensation amount setting circuit for storing a value corresponding to an angular difference between a grinding starting point of the workpiece and the reference detecting point of said detecting means;

a counter responsive to a unit signal from said detecting means for designating a memory address of said memory means to thereby read out a rotational speed data stored at the designated memory address, the content of the compensation amount setting circuit being preset in said counter as an initial value each time said detecting means generates a reference signal; and

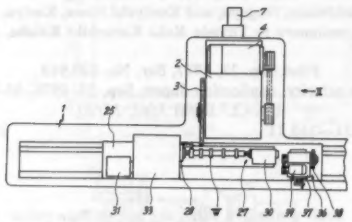
means connected between said memory means and said servomotor for controlling the rotational speed of said servomotor in response to the rotational speed data read out by said counter to thereby rotate the workpiece at a constant circumferential speed at any angular position of the workpiece.

4,122,635

GRINDING MACHINE WITH A TRUING DEVICE

Hiroaki Asano, Chiryu, and Toshio Tsujiuchi, Anjoh, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 11, 1977, Ser. No. 841,106
Int. Cl.² B24B *49/18*
U.S. Cl. 51—165.71 **9 Claims**



1. A grinding machine comprising:

a bed,

a wheel head slidably mounted upon said bed and adapted to rotatably carry a grinding wheel,

work support means for rotatably supporting a workpiece,

truing means for truing said grinding wheel,

feed means for feeding said wheel head toward and away from said truing means,

original position detecting means for detecting an absolute original position of said wheel head,

distance designation means for designating a distance which is necessary for said wheel head to move from said absolute original position toward said truing means so as to infeed said grinding wheel by a predetermined truing infeed amount against said truing means, and

feed control means responsive to a truing instruction for controlling said feed means to feed said wheel to said absolute original position determined by said original position detecting means and then to feed said wheel head by said distance designated by said distance designation means from said absolute original position toward said truing means.

4,122,636

SYNTHETIC RD DIAMOND PARTICLES

Alexander R. Roy, 16 Cecil St. Meredale,, Johannesburg, Transvaal, and Anthony B. Clarke, Plot 54,"Vischukuil", P. O. Endicot, Transvaal, both of South Africa

Division of Ser. No. 505,982, Sep. 13, 1974, Pat. No. 4,036,937.
This application Feb. 15, 1977, Ser. No. 768,886
Claims priority, application South Africa, Sep. 14, 1973, 73/7322
Int. Cl.² C01B *33/06*; C09K *3/14*
U.S. Cl. 51—298 R **5 Claims**

1. An elongate, synthetic RD diamond particle having a long axis and a transverse short axis, the ratio of the long axis to the short axis being at least 3 to 1 and having a ribbed structure down its long axis, the ribs of the structure being traces of <111> crystallographic planes and the long axis providing a backbone for the structure and being in the <100> crystallographic direction.

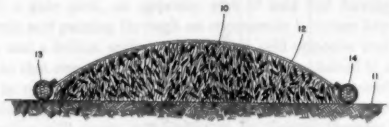
2. An RD diamond particle according to claim 1 which is in the range 60/170 U.S. mesh.

4,122,637

WINDROW RETAINER, AND METHOD OF CONFINING WINDROWS

Glen V. Runge, 6738 28th St., Hudsonville, Mich. 49426, and Glenn B. Morse, Grand Rapids, Mich., assignors to Glen V. Runge, Hudsonville, Mich.

Filed Apr. 22, 1977, Ser. No. 789,983
Int. Cl.² B62D *63/04*
U.S. Cl. 52—3 **2 Claims**



1. A windrow retainer, comprising

a plurality of elongated rollable flexible members each having an axially central portion formed at least by spaced transverse strands; and

flexible tubes extending along the lateral margins of each of said members and integral therewith, said tubes forming fillable and drainable containers of liquid; and

conduit means interconnecting said members in sequence, said conduit means incuding a valve.

4,122,638

FOLDING STRUCTURES CONSIDERED TO BE PRIMARILY USEFUL FOR PLAY PURPOSES

Edward D. O'Brian, 910 Iroquois, Anaheim, Calif. 92801, and William M. Plachy, 3353 San Marcos Blvd., San Marcos, Calif. 92069

Filed Apr. 12, 1977, Ser. No. 786,884
Int. Cl.² E04B *1/344*
U.S. Cl. 52—70 **16 Claims**

1. A folding structure which includes:

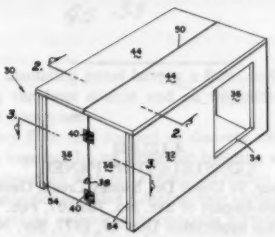
two movable walls which during the folding and unfolding

of said structure are moved toward and away from one another,

a foldable limiting means connecting said walls for limiting the distance said walls may be moved away from one another,

a foldable toggle linkage connecting said walls for holding said walls as far from one another as said limiting means allows said walls to be moved away from one another,

said toggle linkage including at least two toggle links pivotally connected in end-to-end relationship, an end of one of said toggle links being pivotally connected to one of said walls, an end of another of said toggle links being pivotally connected to the other of said walls,



said pivotal connections of said toggle linkage having axes located so that said toggle linkage passes through a position which is overcenter relative to the connections of said toggle linkage to said walls when said walls are spaced as far from one another as permitted by said limiting means,

said toggle links of said toggle linkage in said unfolded position engaging one another and said walls so as to hold said walls as far from one another as permitted by said limiting means,

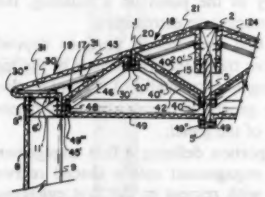
said limiting means being under tension and said toggle links being under compression and restrained against movement by contact with one another and said walls and by the compressive forces of said limiting means as applied to said toggle linkage through said walls when said structure is unfolded.

4,122,639

BUILDING STRUCTURE

John M. Barrell, Peachtree City, Ga., assignor to Renaissance Creations, Inc., Atlanta, Ga.

Filed Jan. 12, 1977, Ser. No. 758,718
Int. Cl.² E04C *3/07*
U.S. Cl. 52—90 **2 Claims**



1. A building construction of prefabricated, abutted, vertical panels of a predetermined height to form a side wall for said building, the upper ends of said vertical side wall panels having means extending substantially horizontally over the upper ends thereof for supporting at least one side of a roof, the improved roof comprising:

a. said roof being formed with a plurality of roof panels wherein each panel is formed in two sections extending in the same plane from the side wall of the building to a laterally extended ridge member, each of the two roof sections being joined at one of the respective ends, the opposite end of one of the roof panel sections extending upwardly to a said lateral ridge member and means for securing said roof panel to the ridge member, the opposite end of the opposite roof panel section extending downwardly to substantially the horizontal side supporting means carried on the upper end of the side panels and means for fixing the said ends of the roof panels to the said roof supporting means carried by the side wall;

b. said lateral ridge member extending downwardly to a distance ending substantially in a horizontal plane with the upper ends of the wall members;

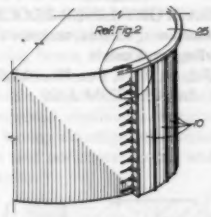
c. said jointure of the two roof sections having matched turned-in edges to engage each other and means for joining said ends to each other, and a pair of reinforcing roof members one extending angularly downwardly from the jointure of the two roof sections to the upper end of the side wall, and the opposite end of the other reinforcing member extending angularly downwardly and in the opposite direction from the jointure of the two roof section members to substantially the lower edge of the extended ridge member, and means for securing said members at their respective ends.

4,122,640

INSULATED TANK JACKETING SYSTEM

Alfred D. Commins, Livermore; Frederick T. Kindelvich, and Richard C. Schroter, both of Orinda, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 25, 1977, Ser. No. 827,643
Int. Cl.² B65D *25/16*
U.S. Cl. 52—248 **13 Claims**

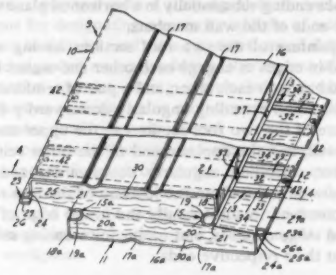


1. An insulating jacketing system for a storage tank wall and the like comprising a plurality of bands arranged circumferentially on and about the outside surface of the tank wall, means tightly securing a band in place, insulated panels secured crosswise of and and against said bands, said panels comprising channel-shaped sections having upstanding and opposed side flanges, one of which includes a terminal bead and the other of which includes a deformable sleeve that can be folded tightly about the bead on a similarly configured and adjacent channel-shaped section, insulaing material affixed to the underside of each panel section and an articulated fastener securing a pair of panel sections to a band, said fastener comprising a link element interposed between the side flanges of the adjacent panel sections and provided at one extremity with a bulbous rivetlike element insertable within and engageable with the interior wall of the bead of the one panel section about which the sleeve of the adjacent panel section is folded and at the other extremity with a deformable clamp crimped about and engagable with the said band.

4,122,641
WALL STRUCTURE

John A. Bard, Dearborn, and Francis J. Morrison, Grosse Ile, both of Mich., assignors to Walcon Corporation, Ecorse, Mich.

Filed Jul. 28, 1977, Ser. No. 819,799
Int. Cl.[2] E04C 1/10; E04B 1/90
U.S. Cl. 52—403 12 Claims

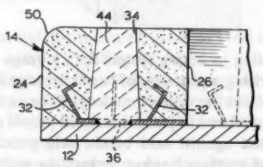


1. In a structural panel, the combination comprising:
(a) a pair of spaced apart panel members;
(b) each of said panel members having a main body portion forming an outer wall, and integral first and second side end portions forming side walls transverse to the outer face and having a free end;
(c) a joint means formed on the free end of each side end portions;
(d) said panel members facing each other and being disposed in a lateral offset relationship; and,
(e) at least one elongated sub-girt fastening member being disposed between said panel members on an acute angular axis relative to the outer walls of the panel members, and being mechanically attached at each end thereof to said joint means on each of the adjacent ends of the panel members for securing the panel members together.

4,122,642
REFRACTORY LINER BLOCK

James P. Buchy, Waterdown, Canada, assignor to Plibrico (Canada) Limited, Burlington, Canada

Filed Jul. 14, 1977, Ser. No. 815,667
Int. Cl.[2] F23M 5/00
U.S. Cl. 52—511 2 Claims



1. A lining block for lining the wall of a kiln of a furnace or the like comprising:
(a) a body of refractory material having an inner face, an outer face and a plurality of side faces, the side faces being adapted to be located in a face-to-face relationship with the side faces of the second block to form a composite lining, a passage extending through the refractory body and having an inner end located at the inner face and an outer end located at the outer face of the body, a recess in the inner face extending laterally from the inner end of said passage,
(b) an anchor plate having an inner surface, an outer surface and an opening extending therethrough from the inner surface to the outer surface, said anchor plate being mounted in said recess with said opening aligned with said passage and said inner surface bearing against an inner wall of the recess, a portion of said anchor plate projecting laterally into said passage and having its outer surface supported in the plane of said inner face of said lining block by engagement of said inner surface with the inner wall of said recess and anchor rib means mounted on said anchor plate and projecting from said anchor plate into said body to secure said anchor plate within said recess, said opening in said anchor plate being aligned with said passage of said block to provide welding access to said portion of said anchor plate.

4,122,643
CONSTRUCTION PANEL

Joseph A. Hafner, 91 Dover Dr., Stoney Creek, Ontario, Canada

Continuation-in-part of Ser. No. 766,107, Feb. 7, 1977, abandoned. This application Dec. 19, 1977, Ser. No. 861,922
Int. Cl.[2] E04D 1/06
U.S. Cl. 52—520 17 Claims

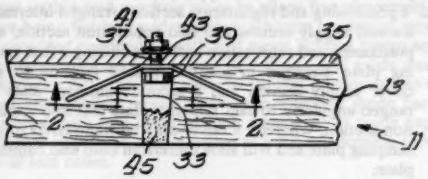
1. An elongated construction panel having a constant cross-section and comprising:
a main portion having a front face which is exposed on assembly of the panel on a building, the main portion having transverse extremities;
marginal first and second portions dependent from said respective transverse extremities of the main portion and extending longitudinally of the panel, these portions extending generally rearwardly with respect to the main portion of the panel;
said first portion defining a first engagement means and a second engagement means spaced rearwardly and outwardly with respect to the first engagement means and terminating in a flange extending outwardly beyond the second engagement means in generally parallel relationship with the main portion for use in attaching the panel to said building;
said second portion defining a third engagement means adapted to selectively co-operate with either another first engagement means of a further panel for producing a lapped siding effect in which an adjacent part of the front face of the further panel is contained in the third engagement means, or another second engagement means of said further panel for producing a flush siding effect.

4,122,644

HEAT-INSULATING FIBROUS PANELS

Richard K. Woodruff, Dundee, Ill., assignor to Refractory Products Co., Carpentersville, Ill.

Filed Jan. 31, 1977, Ser. No. 764,208
Int. Cl.[2] E04C 5/00
U.S. Cl. 52—787 6 Claims



1. A heat insulating panel having a front surface for placement facing the heat source and an opposite rear surface, which panel comprises

a refractory fiber mat formed of discrete refractory fibers bonded together by an inorganic bonding agent, and

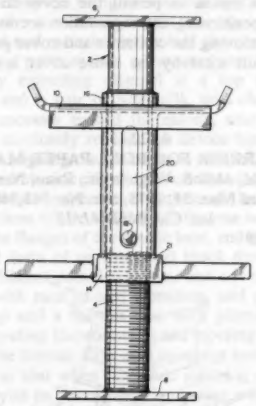
a metal supporting member embedded within said fiber mat, which member includes a central base section and a pair of wing sections extending in opposite directions from said central section and being disposed at an angle of between about 25° and about 50° to said rear surface, said wing sections each containing a plurality of holes so that said individual fibers extend through said holes and thus firmly anchor said member as an integral part of said mat.

4,122,645

APPARATUS FOR USE IN BUILDINGS

Jack R. Tooley, Cobham, England, assignor to Acrow (Engineers) Limited, London, England

Filed Mar. 7, 1977, Ser. No. 774,820
Claims priority, application United Kingdom, Apr. 27, 1976, 17054/76; Nov. 10, 1976, 46810/76
Int. Cl.[2] E04G 17/14
U.S. Cl. 52—648 7 Claims



1. An attachment for a builder's prop, said attachment being adapted to support at least one shuttering element of the type used with concrete formwork, said attachment comprising

a stem having a top bearer plate fixed to the top end thereof and having screw threads provided on a portion thereof,-said stem being connectable to said prop,

a tubular sleeve having an intermediate bearer plate fixed thereto, said tubular sleeve being slidable relative to and coaxially disposed with said stem, and said intermediate bearer plate being adapted to support said shuttering element,

nut means threadably engaged with the threaded portion of said stem, said tubular sleeve being received in seated relation on said nut means so that rotation of said nut means adjustably positions said tubular sleeve longitudinally of said stem, and

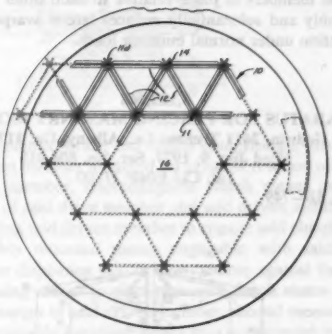
a pin mounted on one of said stem and said sleeve, and a longitudinal slot defined in the other of said stem and said sleeve, said pin and said slot cooperating to prevent rotation of said sleeve relative to said stem as said sleeve is longitudinally repositioned relative to said stem by use of said nut means.

4,122,646

EQUILATERAL DERRICK STRUCTURE

Dennis H. Sapp, Terre Haute, Ind., assignor to Research-Cottrell, Inc., Chicago, Ill.

Filed Jun. 8, 1977, Ser. No. 804,611
Int. Cl.[2] E04H 12/06
U.S. Cl. 52—648 10 Claims



1. A derrick structure comprising:

horizontal angle members;

diagonal brace rod members;

vertical column right cylindrically tubular members; and a plurality of connectors readily removably interconnecting said horizontal, brace, and column members at a plurality of connections to form a rigid, readily assembleable and disassembleable framework derrick defined by a plurality of interconnected equilateral horizontal sections, said connectors having a configuration suitable to have each of at least one said horizontal, brace, and column members secured thereto.

4,122,647

JOIST BRIDGING MEMBER

Paul J. Kovar, 4613 N. 53rd Dr., Phoenix, Ariz. 85031

Filed Jul. 29, 1977, Ser. No. 820,167
Int. Cl.[2] E04C 3/02
U.S. Cl. 52—695 3 Claims

2. An integral bridging element for interconnecting and applying supporting stress to spaced longitudinal juxtapositioned structural members such as joists, roof rafters and studding comprising:

a substantially rigid first beam member for fixedly securing to and being supported at its ends by the exterior edges of a pair of structural members,

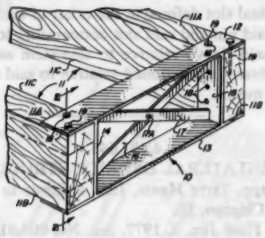
aperture means formed in the ends of said first beam member for aiding in securing it to each of the structural members, and

a pair of spaced parallelly arranged support members extending laterally outwardly of said first beam member from the same side thereof one adjacent each end thereof,

a cross brace disposed between and attached to each of said support members,

said support members being juxtapositioned with the sides of each of the structural members, and

a second beam member extending between the free ends of said support members,



whereby the bridging element spaces and holds the structural members in place relative to each other during assembly and substantially reduces lateral warpage or deflection under normal building loads.

4,122,648

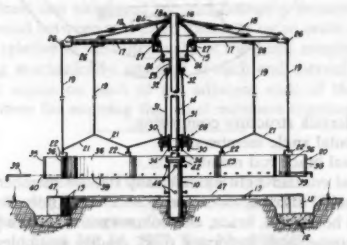
APPARATUS FOR PLACING MASONRY MODULES

Fred D. Godwin, 2611 Trenton La., Albany, Ga. 31705

Filed Jun. 9, 1977, Ser. No. 804,918

Int. Cl.² E04F *21/00*

U.S. Cl. 52—749 **15 Claims**



1. An apparatus for placing masonry modules onto a wall construction comprising a central upstanding support mast, booms carried by said mast near the top thereof and extending outwardly therefrom, suspension cable means movably carried by said booms, means for taking in and paying out said suspension cable means, a masonry module transport and placement frame of trough-like form suspended horizontally about said mast by said cable suspension means from said booms, and movable masonry support elements carried by said frame for supporting said masonry modules when the modules are disposed within said frame and when said support elements are in prescribed positions in said frame, said support elements being movable from their prescribed positions to positions for releasing said masonry modules from said frame.

4,122,649

COVER POSITIONING AND PLACEMENT DEVICE FOR SQUARE CONTAINERS

Thomas D. Sawvel, 10540 Ewing Ave. S., Bloomington, Minn. 55431

Filed Jul. 18, 1977, Ser. No. 816,485

Int. Cl.² B65B *7/28*; B67B *3/22*

U.S. Cl. 53—306 **7 Claims**

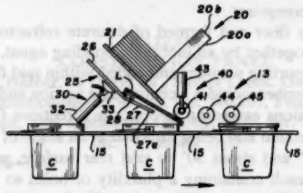
1. A device for automatically positioning and placing generally rectangular covers on generally rectangular containers including:

a. a cover application section for postively positioning a generally rectangular cover onto a generally rectangular container received into said section;

b. a cover supply section including means for retaining a plurality of covers in a supply position;

c. a positioning and registration section arranged intermediate said supply section and said application section, said positioning and registration section including a first ramping plate arranged in parallel, spaced relation to said cover supply section and a second camming plate arranged angularly to said ramping plate and said application section, whereby a cover may be transferred to said ramping plate and will slide therefrom onto said camming plate;

d. transfer means arranged to select a single cover from said supply and transfer the same to said positioning and registration section;



e. positioning and registration means provided at a selected portion of said camming plate arranged to contact and receive a portion of a cover delivered thereto from said ramping plate and retain the same thereon with a portion of the cover extending into said application section and positioning the cover in spaced relation to the cover receiving portion of a container received into said application section;

f. application means provided in said cover application section arranged to forceably shift the extending portion of the cover into sealed relation with the container and simultaneously shifting the cover from said positioning and registration means to permit the cover to be removed from said positioning and registration section; and,

g. means for moving the container and cover past said application means whereby the entire cover is sealed to the container.

4,122,650

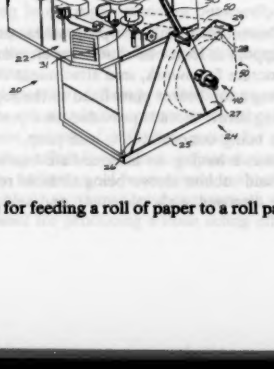
PAPER CARRIER FOR ROLL PAPER MACHINES

W. B. McDonald, 6460 S. Virginia St., Reno, Nev. 89502

Filed Mar. 31, 1975, Ser. No. 563,345

Int. Cl.² B65B *41/12*

U.S. Cl. 53—389 **3 Claims**



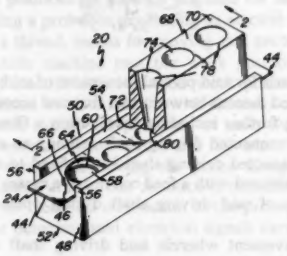
1. A device for feeding a roll of paper to a roll paper utilizing

machine including, in combination with a roll paper means within the roll paper utilizing machine; (1) means to connect to said machine; (2) means to rotatably hold a roll of paper for utilization within said machine in parallel relationship to the base of said machine; (3) means cooperative with said means to hold said roll of paper to guide the paper from said roll to said machine; (4) adaptor means fastened within the roll paper means within said machine so as to allow free movement of paper being fed into said machine; wherein tensioning means are provided cooperative with said paper holding means so as to maintain uniform tension against rotation; said guide means comprises a fully rotatable roller in parallel relationship to the paper roll holding means; and a non-rotatable guide bar is associated with said roller in such manner as to guide paper from said roller into said machine at a 90° relationship to the axis of said roller.

4,122,651
APPARATUS AND METHOD FOR FILLING MEDICINAL DISPENSING DEVICES

Milton Braverman, 640 Wynmill Pl., Philadelphia, Pa. 19115

Filed Sep. 30, 1977, Ser. No. 838,190
Int. Cl.² B65B *3/00, 67/00*
U.S. Cl. 53—390 **10 Claims**

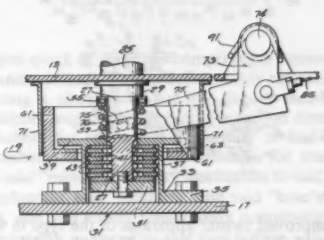


1. Apparatus for filling a medicinal dispensing device with a flowable material, said device including a base having plural chambers for direct receipt of said flowable material therein, each of said chambers being surrounded by flanges and a closure for adhesive securement to said base via contact with said flanges to seal said material within said chambers, said apparatus comprising press means, a base support block having a longitudinally extending channel in a top surface thereof formed between a pair of sidewalls, said channel having a plurality of recesses spaced therealong, said channel being dimensioned to closely receive the device base therein, with said sidewalls aligning the device base within said channel, the recesses in said block being dimensioned and spaced from one another to receive respective chambers of the device therein, with the portions of the channel contiguous with the recesses supporting the flanges of the device base, and removable guide means in the form of an elongated block dimensioned to fit within said channel completely over and covering the flanges contiguous with each of said chambers, said guide means including a top and a bottom face with plural funnel-shaped openings extending therebetween and tapering down from the top face to the bottom face, said openings being spaced from one another so that when the guide means is disposed within the channel with its bottom face in contact with the flanges of the device base each funnel-shaped opening overlies the center of a respective chamber of said base, each opening being arranged to direct a flowable material therethrough and into the chamber disposed therebelow while preventing such material from contacting the contiguous flanges, said sidewalls aligning the device closure within said channel and over the device base after said chambers have been filled, said block including a pair of locating pins located adjacent opposite ends of the channel and extending through openings in the device base and engaging portions of the device closure between the pins to precisely position the device closure longitudinally over the device base, said press means being in the form of an elongated member having a contact face configured to fit closely within said channel to secure the closure to the underlying flanges by applying pressure to force said closure into engagement with said flanges once the chambers have been filled, the guide means removed and the closure inserted within the channel.

4,122,652
LAWN MOWER BLADE CLUTCH AND BRAKE

Theodore J. Holtermann, Milwaukee, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Jul. 16, 1976, Ser. No. 706,122
Int. Cl.² A01D *69/08*
U.S. Cl. 56—11.3 **22 Claims**

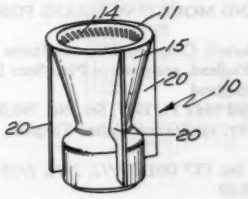


18. A combined brake and clutch comprising a drive member, a driven member mounted for co-axial rotation relative to said drive member, interengagable clutch means extending from each of said drive member and said driven member, first means biasing said driven member to engage said clutch means, non-rotatably mounted means engagable with said driven member for displacing said driven member against the action of said biasing means to disengage said clutch means and for braking rotation of said driven member, second means biasing said non-rotatably mounted means into engagement with said driven member so as to overpower said first means biasing said driven member, and manually operable means for overpowering said means biasing said non-rotatably mounted means.

4,122,653
GROMMET FOR ROVING MACHINE

William Argereu, Hickory Dr., North Scituate, R.I. 02857

Filed Aug. 8, 1977, Ser. No. 822,740
Int. Cl.² D01H *7/46, 7/48*
U.S. Cl. 57—34 R **1 Claim**



1. A roving machine grommet comprising an oil impervious non metallic body having a top and bottom and a hole therethrough opening into said top and bottom and flaring outwardly from bottom to top along a generally inverted frustoconical surface, said surface having friction means adjacent its upper end so located as to be contacted by yarn leading to said opening at an acute angle to the axis of said opening greater than the angle of said surface to said axis, the outer surface of said body being generally parallel to the surface of said hole, and ribs extending radially from the inclined outer surface to a

point the same as the radius of the outer edge of the top of said body.

4,122,654

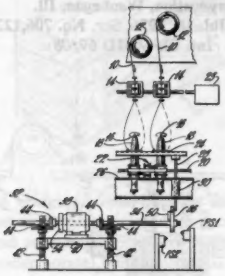
TWIST FRAME CONTROL METHOD AND APPARATUS

Leo A. Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jul. 21, 1977, Ser. No. 817,760

Int. Cl.[2] D01H *1/36, 13/32*

U.S. Cl. 57—54 **8 Claims**



1. An improved twister apparatus of the type in which filamentary material is wound onto bobbins, and in which the yardage of filamentary material wound onto the bobbins is measured, and in which a guide rail reciprocates within a range of reciprocation over a portion of the height of said bobbins, and in which the range of reciprocation is reciprocated along the height of the bobbins in order that said guide rail distribute said filamentary material over a plurality of portions of said bobbins, the improvement comprising:

(a) first detecting means for detecting the presence of said guide rail within a predetermined portion of said bobbins;

(b) means responsive to the measurement of a predetermined yardage of filamentary material for activating said first detecting means;

(c) second detecting means for detecting the presence of said guide rail at a preselected position within the range of reciprocation of said guide rail;

(d) means responsive to the detection of said guide rail by said first detecting means for activating said second detecting means; and,

(e) means responsive to the detection of said guide rail by said second detecting means for discontinuing the movement of said guide rail.

4,122,655

HOUSING AND MOUNTING MEANS FOR OPEN END SPINNERS

Gordon C. Anderson, Clemson, S.C., and James W. B. Clayton, Accrington, England, assignors to Platt Saco Lowell Limited, Helmshore, England

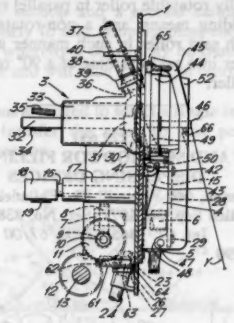
Filed May 11, 1977, Ser. No. 796,000

Claims priority, application United Kingdom, May 18, 1976, 20372/76

Int. Cl.[2] D01H *1/12, 1/16, 1/28*

U.S. Cl. 57—58.89 **4 Claims**

1. In an open end yarn spinning machine comprising a frame, a plurality of side-by-side yarn spinning stations fixed to and spaced along said frame, each of said stations including a housing, a yarn spinning rotor fixed to a shaft defining an axis therefor and for rotation thereabout and fixed to said housing for pivotal movement therewithin, a rotor drive means for rotating said rotor and its shaft in the spinning of yarn and being detachably interconnectable therewith, a fiber separating and opening roller fixed to a shaft defining an axis therefor and for rotation thereabout and fixed to said housing for pivotal movement therewithin, a roller drive means for rotating said roller and its shaft in the separation of fibers into discrete entities for conduction to said rotor and being detachably interconnectable therewith, and housing mounting means for supportively mounting said housing on said frame for pivotal movement between a first operable position wherein said rotor and roller and their shafts are drivingly interconnected to their respective drive means and a second inoperable position wherein said rotor and roller and their shafts are operably detached and disconnected from their respective drive means, said housing mounting means including support elements carried in part by said housing and said frame, said elements



defining an axis for said pivotal movement of said housing and elements fixed thereto between said first and second positions, said housing further including therewithin a fiber feed roller and an interconnected driving shaft defining an axis therefor, said interconnected driving shaft being fixed to said housing and interconnected with a feed roller drive means for continuous rotation of said driving shaft during operation of said machine,

the improvement wherein said driving shaft axis extends parallel to said housing pivotal axis.

4,122,656

COATED PINNED ROLLER

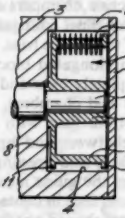
Jack Shaw, Burnley, England, assignor to Platt Saco Lowell Limited, Helmshore, England

Continuation-in-part of Ser. No. 590,859, Jun. 27, 1975, Pat. No. 4,058,965. This application Oct. 6, 1977, Ser. No. 839,872

Claims priority, application United Kingdom, Oct. 19, 1976, 43268/76

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.91 **3 Claims**



1. In an opening roller used for separating textile fibers in an open end spinning machine, which roller comprises a cylindrical shell and a plurality of pins fixed to said shell and protruding outwardly from its cylindrical surface, said pins each having a body portion fixed to said shell and a fiber-engaging portion protruding outwardly therefrom, the improvement wherein said fiber-engaging portion has a wear-resistant surface formed with a coating of carbo-chrome.

4,122,657

APPARATUS FOR MONITORING FOR THREAD BREAKAGE A CONTINUOUS SEQUENCE OF WORK POSITIONS ON A TEXTILE MACHINE

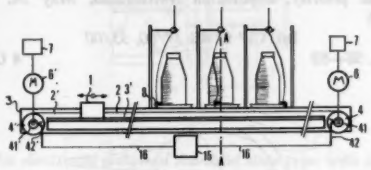
Ernst Felix, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Oct. 5, 1977, Ser. No. 839,449

Claims priority, application Switzerland, Nov. 5, 1976, 013947/76

Int. Cl.[2] D01H *13/16*

U.S. Cl. 57—81 15 Claims



1. An apparatus for monitoring a continuous sequence of spaced work positions on a textile machine for thread breakage, comprising a probe for generating an electric signal upon detection of a thread, means for moving said probe on a path along the textile machine past the work positions so as to generate said electric signal at each work position where a thread is detected without contact with elements of the textile machine, which signals are produced at each work position only during correct thread travel and fail when there is no thread, said means for moving the probe along the textile machine including at least one conductive metallic drive band which forms an electrical connection to the probe, and detector means for detecting said electrical signals carried by said drive band.

4,122,658

FALSE-TWIST YARN AND PROCESS

Atsumi Morioka, and Tamotsu Nakashima, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,502

Claims priority, application Japan, May 10, 1977, 52-53444

Int. Cl.[2] D02G *1/00, 3/04*

U.S. Cl. 57—140 R 17 Claims

1. A false-twist yarn comprising a plurality of false-twisted "islands-in-a-sea" type composite synthetic polymer filaments, said filaments comprising a plurality of island components having a predetermined melting point, and a sea component having a melting point below that of said island components, characterized in that the cross-sectional configuration of the composite filament as a whole has been deformed the cross-sectional configuration of each of the island components in said filaments is substantially free of deformation.

4,122,659

DIGITAL CLOCK OF LEAF TYPE

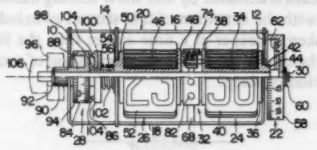
Katuo Hashimoto, Iida, Japan, assignor to Iida Sankyo Kabushiki Kaisha, Japan

Filed Nov. 18, 1976, Ser. No. 742,890

Claims priority, application Japan, Nov. 20, 1975, 50/157515

Int. Cl.[2] G04B *13/00, 19/02, 19/20*

U.S. Cl. 58—7 10 Claims



1. A digital clock of leaf type comprising a "minute's" display mechanism including a first continuously rotatable bobbin for supporting a plurality of leaf-like display members, and "hour's" display mechanism including a second continuously rotatable bobbin for supporting a plurality of leaf-like hour display members and a rotary transmission for transmitting rotation of said "minute's" display mechanism to said "hour's" display mechanism, said "minute's" and said "hour's" display mechanism, and said rotary transmission comprising a planetary gear rotatably mounted to said first bobbin adjacent said second bobbin, a fixed ring gear disposed between said first and second bobbins and in meshing engagement with said planetary gear for rotating said planetary gear as said first bobbin rotates, and a driven gear connected to said second bobbin in meshing engagement with said planetary gear rotatable by said planetary gear as said first bobbin rotates.

4,122,660

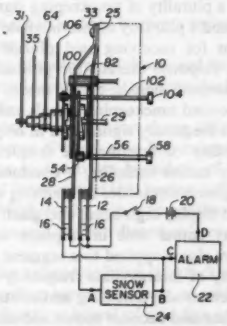
SNOW ALARM

Richard J. Canavan, 46 Merton Ave., Lynbrook, N.Y. 11563

Filed Jun. 9, 1977, Ser. No. 805,093

Int. Cl.[2] G04B *23/06*

U.S. Cl. 58—16.5 7 Claims



1. In a clock having a main shaft, a clock face and hands for indicating the time, a plurality of timing gears connected with the shaft, means for presetting a time, a pointer adjacent the clock face for indicating the time preset, and an alarm associated with the clock and for alarm operation thereby when the preset time is reached, the invention comprising:

means associated with the clock for sensing an accumulation of snow, including first switchable means responsive to the detection by said snow sensing means of an accumulation of snow;

means on the clock for presetting a second time for alarm operation, whereby the second preset time may be earlier

than the first preset time for alarm operation prior to the first preset time;

second switchable means on the clock and for actuation at the second preset time, said second switchable means being in series electrical connection with said first switchable means and the alarm; and

means on the clock for actuating said second switchable means at the second preset time, whereby the alarm is operable at the second preset time when said first switchable means is actuated by said snow sensing means concurrently with the actuation of said second switchable means to awaken a sleeper at a time earlier than the first preset time when there has been an accumulation of snow during the period of sleep.

4,122,661

ELECTRONIC TIMEPIECE DIGITAL DISPLAY DRIVE CIRCUIT

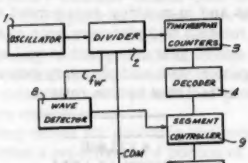
Masuo Tsuji, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,094

Claims priority, application Japan, Feb. 9, 1976, 51-12975

Int. Cl.² G04C 3/00

U.S. Cl. 58—23 R **11 Claims**



1. An electronic timepiece comprising timekeeping means for producing a plurality of timekeeping signals representative of actual time and a plurality of intermediate frequency signals; decoder means for receiving said plurality of timekeeping signals and in response thereto for producing a plurality of decoded timekeeping signals; driver means for receiving said plurality of decoded timekeeping signals and one of a plurality of intermediate frequency signals and in response thereto producing a plurality of intermediate frequency display drive signals; display means including a common electrode and a plurality of segment electrodes for defining at least one display digit, each said display digit being energized in an AC mode to thereby display actual time in response to an intermediate frequency drive signal applied to a segment electrode and one of said plurality of intermediate frequency signals applied to said common electrode; detecting and controlling means coupled intermediate said decoder means and said driver means for receiving the intermediate frequency signal applied to said common electrode and for inhibiting each of said decoded timekeeping signals from being applied to said driving means to thereby prevent said digital display means from being energized in response to detecting the absence of said intermediate frequency signal applied to said common electrode, said detecting and controlling means including a wave detector means for receiving said intermediate frequency signal applied to said common electrode and in response thereto for detecting the absence of said intermediate frequency signal applied to said common electrode producing a detecting signal, and segment controller means coupled to said wave detector means for receiving said detecting signal and said plurality of decoded timekeeping signals, and in response thereto being adapted to prevent said decoded timekeeping signals from being applied to said driver means to thereby prevent a voltage difference from being effected between the segment electrode and control electrode of each display digit.

4,122,662

WRIST WATCH IDENTIFICATION

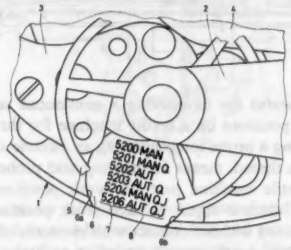
Gerald Visconti, Bellach, Switzerland, assignor to A. Schild S.A., Switzerland

Filed May 2, 1977, Ser. No. 792,856

Claims priority, application Switzerland, May 14, 1976, 6073/76

Int. Cl.² G04B 17/00, 33/00

U.S. Cl. 58—59 **4 Claims**



1. A wrist watch movement comprising a platin with an inside face and a peripheral edge, a balance cock secured on said platin, a balance wheel mounted between said cock and said platin said balance wheel having a felloe passing near said peripheral edge, a flat recess in said inside face of the platin, visible through said felloe and a double series of markings provided within said flat recess, one of said series of markings being formed of numbers.

4,122,663

STOP WATCH AND TIMING DEVICE

Bruce A. Kock, 6017 Ocean View Dr., Oakland, Calif. 94618

Filed Mar. 18, 1976, Ser. No. 668,086

Int. Cl.² G04B 11/00, 27/04; G04F 7/06, 7/08

U.S. Cl. 58—74 **49 Claims**

1. In a resettable stop watch which includes driving means, a time train connecting the driving means to an escapement, a dial train, resettable time indicating means connected to said dial train, the improvement comprising,

a normally engaged clutch for coupling the dial train to the time train, and

clutch actuating means for disengaging the clutch during resetting of the time indicating means.

4,122,664

ELECTRONIC WATCH

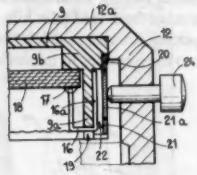
Jean-Marcel Stampfli, Le Landeron, Switzerland, assignor to Ebauches Electroniques S.A., Switzerland

Filed Mar. 9, 1977, Ser. No. 775,746

Claims priority, application Switzerland, Mar. 25, 1976, 3719/76

Int. Cl.² G04B 37/12

U.S. Cl. 58—88 B 7 Claims



1. An electronic watch of the solid state type with no movable mechanical elements excepting the control elements which are manually operable to control the functions of the watch, said watch comprising, a body retaining all of the electrical components of the watch including the display devices thereof, said electrical components being completely surrounded with insulating material to render the watch humidity resistant, a metallic ring surrounding said body, said ring being elastically deformable at least at some locations thereon, said ring being maintained on the greatest portion of its height at a distance from said body, electrical contact blocks connected with electrical components within the body, said blocks being carried by the body at a location opposite the deformable portions of the ring, the ring being connected to ground of the watch, whereby exertion of a radial force on the ring at a location opposite one or the other of said blocks will deform the ring to cause the same to contact a block and ground the ring to control a function of the watch.

4,122,665

METHOD OF MANUFACTURING A PALLET LEVER AND PALLET LEVER MADE BY THIS METHOD

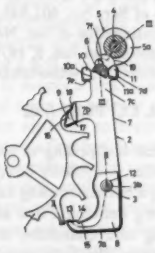
Urs Giger, Solothurn, Switzerland, assignor to ETA A.G. Ebauches-Fabrik, Switzerland

Filed Jul. 6, 1976, Ser. No. 703,010

Claims priority, application Switzerland, Aug. 5, 1975, 10203/75

Int. Cl.² G04B 15/08

U.S. Cl. 58—121 R 15 Claims



1. In a method of manufacturing a pallet lever for a timepiece movement of the type wherein a lever body is formed in one piece with active elements having functional faces intended to cooperate with an escape wheel and an impulse pin, respectively, the improvement comprising the steps of:

forming from a plane metal plate by stamping, a plurality of blocks projecting from one plane face of that plate, and constituting active elements, and,

thereafter blanking said lever body along an outline passing outside the contours of said blocks at least at the locations of the functional faces thereof.

4,122,666

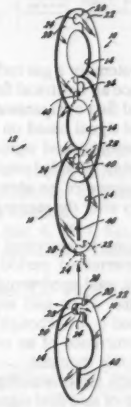
CHAIN

Quenton W. Jessop, 2351 Spruce St., Carlsbad, Calif. 92008

Filed Jul. 19, 1976, Ser. No. 706,439

Int. Cl.² F16G 13/18

U.S. Cl. 59—80 18 Claims



1. The improvement in a chain having a series of interlocking links, comprising:

(a) each link being of uniform thickness and having flat faces and being formed from a thin, uniform-thickness sheet of plastic material,

(b) said link having a closed form shape defining a central opening and being divided on a line extending from the central opening to the outer boundary of the link, said plastic material forming said link having sufficient flexibility so that said link can be joined to another by spreading open said link on said line in a direction lateral of said faces of said link,

(c) said line having a shape defining interlocking link ends at said line preventing spreading apart of said link ends at said line in a direction lateral of said line in the plane of said link, whereby said link ends remain locked as long as said link ends remain in the same plane and as long as there is no material failure, and

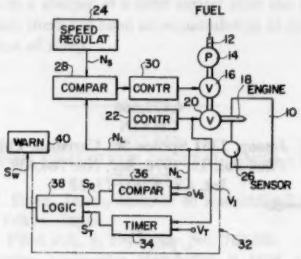
(d) said opening being oblong and said link having said line at a first end thereof and having at the second end thereof a slot open to said opening and extending part way toward the outer boundary of said link and of a size to match the cross-sectional width and thickness of said first end at said line, first and second adjoining links in said chain being connected with said first end of the first link received in the slot at the second end of said second link with the walls of that slot holding interlocking link ends in a common plane thereby preventing separation thereof.

4,122,667

SYSTEM FOR DETECTING ABNORMALITY IN FUEL FEED CONTROL SYSTEM OF GAS TURBINE ENGINE

Akio Hosaka, and Eiji Tsuruta, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 7, 1976, Ser. No. 748,299
Claims priority, application Japan, Dec. 8, 1975, 50/165504[U]
Int. Cl.[2] F02C 7/26
U.S. Cl. 60—39.09 R 6 Claims



1. A fuel feed control system for a gas turbine engine, including sensor means to produce an electrical first signal representing actual engine speed and first comparator means for producing a fuel feed rate control signal based on the magnitude of a deviation of the actual engine speed signal from a reference signal representing a variably intended engine speed, a subsystem for detecting the presence of an abnormality in the fuel feed control system shortly after the starting of the engine, said subsystem comprising:

timer means for producing an electrical second signal after the lapse of a predetermined period of time from the starting of said engine, said predetermined period of time being chosen such that when said second signal is produced the engine speed is low enough to take preventive action against the occurrence of an overrun if an abnormaility is detected at this moment;

second comparator means for producing an electrical third signal if the amplitude of said first signal is below a predetermined value corresponding to an engine speed normally expected after the lapse of said predetermined period of time from the starting of said engine; and

logic means, connected to receive said second and third signals from said timer means and said comparing means for producing an electrical warning signal when said third electrical signal has a predetermined relationship to said second electrical signal.

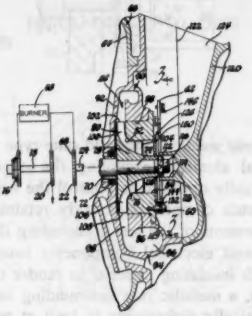
4,122,668

IRIS CONTROL FOR GAS TURBINE ENGINE AIR BRAKE

Cheng-Chien Chou, Carmel, Ind., and Theodore L. Rosebrock, Rochester, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 707,494, Jul. 22, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,568
Int. Cl.[2] F02C 7/02
U.S. Cl. 60—39.16 R 4 Claims

1. A flow controlled air brake assembly for braking a power shaft of a two shaft gas turbine engine comprising a turbine engine bulkhead, a power shaft extending through said bulkhead, a compressor case secured on said bulkhead having a pump chamber with an axial inlet and a radially located outlet, an air brake impeller located within said pump chamber secured to said shaft for rotation within said chamber, said impeller having blade means thereon to produce high specific work on air flow thereacross and an axially extending inlet hub surface, said blade means having an inlet inducer segment on said inlet hub surface, a plurality of iris vanes located circumferentially around said axial inlet, each of said vanes having a pivoted outer end and a free end, means for supporting said outer end on said case for pivotal movement of said vane with respect to said inlet, each of said vanes having a curved first edge segment thereon and a curved second edge segment thereon, control means for positioning said vanes in a maximum air throttle control position wherein each of said free ends engage a second edge segment to locate said first edge segments as a continuous circular edge, said first and second curved edge segments having an arcuate extent and radius to space said circular edge from said inlet hub surface to define an annular orifice opening around said inlet hub to produce limited mass air flow to the impeller to minimize power loss therefrom while maintaining flow of cooling air through the impeller, said annular orifice being located immediately axially upstream of said inlet inducer segment at a closely coupled distance so as to cause high velocity air streams downstream of said orifice to enter said inlet inducer segment before the air stream expands to fill the flow passage upstream of said inlet inducer thereby to reduce aerodynamic stall in said impeller at said limited mass air flow, said control means having a maximum brake control position wherein said vanes are swung completely radially outwardly of said inlet to define a large area annulus between said vanes and said inlet hub surface for unrestricted air flow into said impeller to produce increased power loss therefrom with resultant braking of said power shaft.



4,122,669

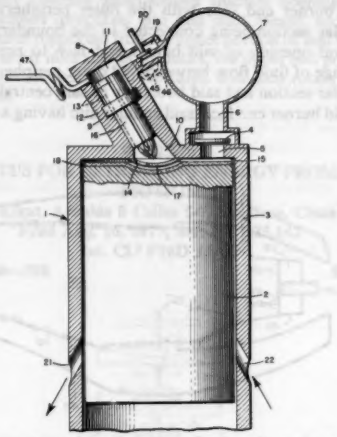
SINGLE STAGE OR MULTI-STAGE EXPANSION ENGINE

Cornelis Hubers, Van Ostadelaan 2, Rozenburg, Netherlands

Continuation-in-part of Ser. No. 401,538, Sep. 27, 1973, abandoned, which is a continuation of Ser. No. 193,687, Oct. 29, 1971, abandoned. This application Jan. 5, 1976, Ser. No. 646,419
Claims priority, application Netherlands, Oct. 29, 1970, 7015863
Int. Cl.[2] F02G 1/02
U.S. Cl. 123—200 6 Claims

1. An expansion engine comprising at least one cylinder, a piston within said cylinder, a cylinder cover provided with a construction comprising a burner housing and an air accumulator reservoir, said housing defining a first and a second chamber, a partition dividing said chambers, at least one burner positioned in said partition, the first chamber of the burner housing being in open communication with the cylinder by means of an opening, the second chamber communicating with said air accumulator reservoir, a non-return valve connecting said reservoir to said cylinder, at least one pressure equalizing conduit interconnecting said chambers, said conduit being constructed as a seal to prevent combustion gases and combus-

tion air from passing therethrough, means to supply fuel to the burner and means for controlling the quantity of air for furnishing power and for maintaining the flame at a minimum capacity during the remainder of the cycle.

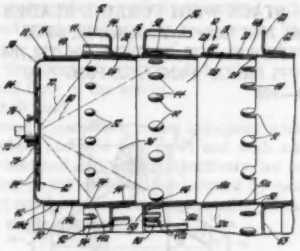


4,122,670

PARALLEL STAGE FUEL COMBUSTION SYSTEM

Samuel B. Reider, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1977, Ser. No. 765,846
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—39.65 3 Claims



1. A combustor assembly for a gas turbine engine, comprising a head plate, a combustor liner joined to said plate including an outer wall and an inner wall, a plurality of pilot air holes in said liner located a first predetermined distance downstream of said head plate to supply a first combustion zone within said liner, a plurality of main air holes in said liner located downstream of said pilot air holes to supply a second combustion zone within said liner, a first fuel injection nozzle supported on said head plate for directing a first narrow fuel spray cone of a predetermined included angle to maintain a non-flammable air/fuel mixture within said first combustion zone at said narrow fuel spray cone, said narrow fuel spray cone being dispersed at said second combustion zone to define a flammable air/fuel mixture, a second fuel injection nozzle supported on said head plate in parallel to said first nozzle and including means therein to produce a wide angle fuel cone for supplying a fuel dispersion into said first combustion zone for combustion with air flow through said pilot air holes prior to passage into said second combustion zone to prevent combustor flame blow-out under lean fuel/air ratios.

4,122,671

HYDRAZINE DECOMPOSITION AND OTHER REACTIONS

Warren E. Armstrong, Lafayette; Donald S. La France, Walnut Creek, and Hervey H. Voge, Berkeley, all of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 26, 1962, Ser. No. 234,280
Int. Cl.[2] C06D 5/04
U.S. Cl. 60—218 10 Claims

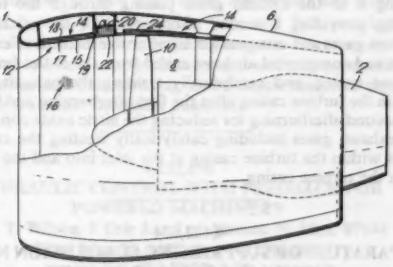
1. A method for the self-starting decomposition of liquid hydrazine which comprises contacting the hydrazine with a catalyst consisting essentially of a porous support having a surface area of at least about 3 square meters per gram and about 0.1 to about 35% by weight of a mixture of ruthenium with at least one metal of the group consisting of iridium and platinum in which the ruthenium is about 20 to about 70 atom percent of said metals.

4,122,672

DUCT LININGS

Brian W. Lowrie, Allestree, England, assignor to Rolls-Royce Limited, London, England

Filed Apr. 4, 1977, Ser. No. 784,637
Claims priority, application United Kingdom, Apr. 5, 1976, 3739/76
Int. Cl.[2] F02K 3/06, 1/26
U.S. Cl. 60—226 R 8 Claims



1. In a duct containing an axial fluid-flow bladed rotor whose rotor blade tips attain a velocity of at least mach 1.1 relative to the fluid at a predetermined rotational speed, a non-sound absorbing by resonance acoustic lining which at said predetermined speed acts to combat the degeneration of shock-waves at blade passing frequency into multiple pure tone noise and which forms at least part of the duct wall near to the plane of rotation of said blades, said non-sound absorbing by resonance liner comprising a pervious facing skin, an impervious backing layer, and a spaced cell honeycomb layer sandwiched between said facing skin and said backing layer, said cells being of a depth substantially equal to half the wavelength of said blade passing frequency, whereby shock-wave energy which enters said non-sound absorbing by resonance liner is fed back into the duct to tend to maintain regular spacing and uniform amplitude of the shockwave pattern in said duct.

3. The combination of claim 1 in which the bladed rotor comprises a fan rotor in a turbofan aero engine.

4,122,673
INTERNAL COMBUSTION ENGINE WITH AFTERBURNING AND CATALYTIC REACTION IN A SUPERCHARGER TURBINE CASING

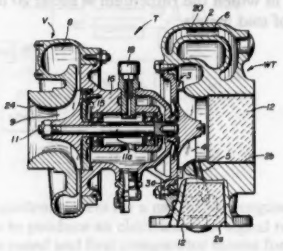
Alfred Leins, Uhingen, Germany, assignor to J. Eberspächer, Esslingen am Neckar, Germany

Continuation-in-part of Ser. No. 745,868, Nov. 29, 1976, abandoned, which is a continuation of Ser. No. 508,838, Sep. 24, 1974, abandoned. This application Mar. 10, 1977, Ser. No. 776,180

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1973, 2348866

Int. Cl.[2] **F01N** *5/04;* **F02B** *33/40;* **F01D** *9/02, 25/00*

U.S. Cl. 60—274 **19 Claims**



1. Method of cleaning the exhaust gases from a liquid fuel driven engine utilizing a turbosupercharger connected to the engine and including a turbine having a turbine casing, and a compressor, comprising the steps of accumulating the exhaust gases from the engine for increasing the temperature of the gases, initiating combustion of unreacted fuel in the exhaust gases for effecting a first afterburning between the engine and the turbine and before passing the exhaust gases into the turbine casing, passing the exhaust gases through the turbine casing, compressing fresh air within the compressor, withdrawing a part of the compressed air from the compressor and adding it to the exhaust gases passing through the turbine casing, providing a second afterburning of the mixture of exhaust gases and compressed air after the mixture of exhaust gases and compressed air have exited from the outlet from the turbine casing, and catalytically treating the exhaust gases within the turbine casing after the first afterburning and before the second afterburning for reducing the nitric oxide content in the exhaust gases including catalytically treating the exhaust gases within the turbine casing at the inlet into and the outlet from the turbine casing.

4,122,674
APPARATUS FOR SUPPRESSING COMBUSTION NOISE WITHIN GAS TURBINE ENGINES

Anders O. Andersson, Seattle, and Robert B. Purves, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

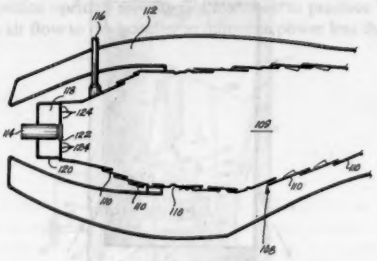
Filed Dec. 27, 1976, Ser. No. 754,584

Int. Cl.[2] **F02C** *7/24*

U.S. Cl. 60—39.65 **7 Claims**

1. In a gas turbine combustor apparatus including at least one burner having wall means defining an end face and an oppositely disposed substantially open end wherein fuel is injected into the interior region formed by said wall means by a fuel nozzle adapted for mounting within a central opening of said burner end face, said fuel being ignited within said interior region of said burner to supply a flow of gaseous combustion products through said open end of said burner, the improvement comprising:

a noise suppressing cavity for reducing the combustion noise generated by the ignition of said fuel within said burner, said noise suppressing cavity including an annular disc transversely disposed across said interior region of said burner and a tubular section for the injection of said fuel into said interior region of said burner, said tubular section extending from said central opening of said burner end face to the central opening within said annular disc, said tubular section passing through said central opening of said burner end face with the outer periphery of said tubular section being connected to the boundary of said central opening of said burner end face to prevent the passage of fluid flow between said outer periphery of said tubular section and said boundary of said central opening in said burner end face, said annular disc having a plurality



of openings therein for placing said noise suppressing cavity in acoustic communication with said interior region of said burner, said openings of said annular disc and said noise suppressing cavity being dimensioned and arranged to effect a minimum acoustic impedance relative to a theoretical constant velocity acoustic source positioned within a predetermined region of said interior region of said burner, said burner wall means being imperforate in the region extending from said burner end face to said transversely disposed annular disc.

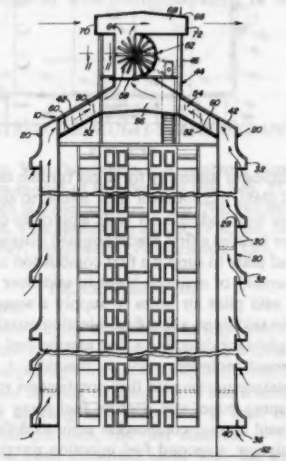
4,122,675
SOLAR HEAT SUPPLEMENTED CONVECTION AIR STACK WITH TURBINE BLADES

Jack Polyak, 1015 Kelly Ave., Joliet, Ill. 60435

Filed Mar. 17, 1977, Ser. No. 778,784

Int. Cl.[2] **F02C** *1/02;* **F03G** *7/00*

U.S. Cl. 60—398 **9 Claims**



1. In combination with a high rise building of the type including upstanding peripheral side walls, at least one of said side walls including horizontally spaced apart vertical tiers of vertically spaced windows, at least one duct means having a vertical outer wall, said duct means extending along, supported

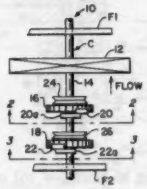
from and projecting outwardly of said one side wall between a pair of adjacent tiers of windows, said outer wall including vertically spaced horizontally outwardly projecting and downwardly opening snout-shaped shrouds opening in upwardly inclined directions into said duct means, and rotary turbine means supported from an upper portion of said building including an air inlet and an air outlet, the upper end portion of said duct means being communicated with said rotary turbine means inlet.

4,122,676

APPARATUS FOR EXTRACTING ENERGY FROM WAVE MOTION

Edmundo Kikut, Avenida 8 Calles 5-7, San Jose, Costa Rica

Filed Aug. 16, 1977, Ser. No. 825,142
Int. Cl.[2] F16D *33/00*
U.S. Cl. 60—398 **5 Claims**



1. Apparatus for extracting energy from the motion of water waves during both the ebb and flow of such waves, said apparatus including at least one wave responsive drive unit comprising:

a screw propeller adapted to be disposed in the path of such waves and rotatable in opposite directions responsive to the ebb and flow of the waves;

a drive shaft on which said propeller is mounted;

first and second ratchet wheels rotatably mounted on said shaft at spaced locations therealong;

first and second pawls respectively associated with said first and second ratchet wheels for respectively limiting the transmission of the rotation of said drive shaft to said opposite directions of rotation of the shaft produced by the ebb and flow of the waves;

an output shaft; and

first and second transmission means associated with said first ratchet wheel and said first pawl and with said second ratchet wheel and said pawl, respectively, for converting the rotation of the drive shaft produced by each ratchet wheel and pawl combination into rotation of said output shaft in a single direction.

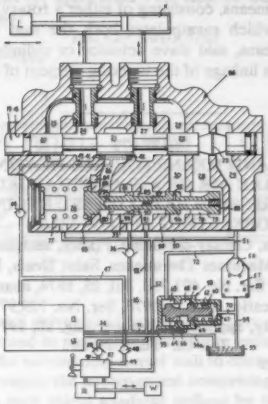
4,122,677

LOAD RESPONSIVE VALVE ASSEMBLIES

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 559,818, Mar. 19, 1975, Pat. No. 3,984,979, and a continuation-in-part of Ser. No. 522,324, Nov. 8, 1974, Pat. No. 3,998,134, and a continuation-in-part of Ser. No. 655,561, Feb. 5, 1976. This application Jul. 27, 1976, Ser. No. 709,205
The portion of the term of this patent subsequent to Oct. 12, 1993, has been disclaimed.
Int. Cl.[2] F15B *13/08*
U.S. Cl. 60—427 **17 Claims**

11. Multiple load responsive valve assemblies each comprising a housing having a fluid inlet chamber connected to pump means, said pump means having fluid output control means, a fluid supply chamber, first and second load chambers, a fluid outlet chamber, a fluid exhaust chamber, and fluid exhaust means connected to reservoir means, first valve means for selectively interconnecting said fluid load chambers with said fluid supply chamber and said fluid outlet chamber, said first valve means having variable metering orifice means operable to throttle fluid flow between said exhaust chamber and said fluid exhaust means, pressure sensing means selectively communicable with said load chambers by said first valve means and operable to transmit control load pressure signal to said fluid output control means, means to interconnect fluid exhaust means of said valve assemblies to form common exhaust manifold means, exhaust pressure relief valve means interposed between said exhaust manifold means and said reservoir means, second valve means having first throttling means between said fluid inlet chamber and said fluid supply chamber, said second valve means being responsive to pressure in said fluid exhaust



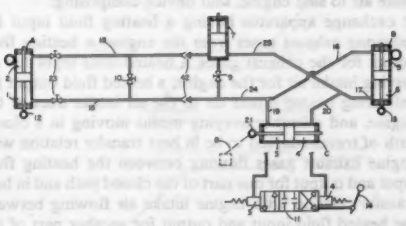
chamber and operable to maintain said pressure in said fluid exhaust chamber at a first relatively constant preselected pressure level while fluid flow is being throttled by said first throttling means, said second valve means having isolating means to isolate said fluid supply chamber from said fluid inlet chamber when one of said load chambers is connected to said fluid outlet chamber by said first valve means and said exhaust chamber is at a pressure higher than said first preselected pressure level, and fluid replenishing means to interconnect for fluid flow said fluid supply chamber and said exhaust manifold means when said fluid isolating means isolate said fluid supply chamber from said fluid inlet chamber.

4,122,678

HYDRAULIC CONTROL WITH FEEDBACK FOR POWERED MACHINERY

Mahlon T. Wilson, 5 Erie La., Los Alamos, N. Mex. 87544

Filed May 23, 1977, Ser. No. 799,695
Int. Cl.[2] F15B *7/00*
U.S. Cl. 60—571 **11 Claims**



1. A hydraulic control system with position feedback for powered machinery comprising:

(a) a double-acting hydraulic master means,

(b) a double-acting hydraulic slave means,

(c) a double-acting hydraulic control means, all of said means being hydraulically interconnected,

(d) said master means consisting of either a rotary actuator or cylinder which is situate and mechanically connected to a handle at a control station and hydraulically connected with

(e) the said control means, consisting of a rotary actuator or cylinder which is situate and is mechanically attached to the lever or is incorporated into the control mechanism that actuates the normal motive power system of the working element of the said machinery, and said control means being hydraulically connected with

(f) the slave means, consisting of either a rotary actuator or cylinder which manipulates both the said master and control means, said slave actuator or cylinder being attached on a linkage of the working element of the machinery.

4,122,679

METHOD AND MEANS FOR PRE-HEATING THE INTAKE AIR OF A SUPERCHARGED, LOW-COMPRESSION RATIO DIESEL ENGINE WHEN OPERATING AT LOW LOAD

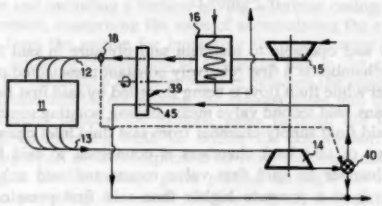
Francis Charron, Croissy-sur-Seine, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Continuation of Ser. No. 491,750, Jul. 25, 1974, abandoned. This application Oct. 6, 1976, Ser. No. 729,977

Claims priority, application France, Aug. 10, 1973, 73 29429

Int. Cl.[2] F02B *29/04*

U.S. Cl. 60—599 **19 Claims**



1. In combination with a supercharged low compression ratio diesel engine including an exhaust duct, an air intake duct, an exhaust gas-driven turbine connected in said exhaust duct and having an inlet for receiving exhaust gases from said engine and an outlet for said gases, a supercharging air compressor, means operatively coupling said turbine to said compressor, said compressor having a discharge outlet connected to said air intake duct and an aftercooler located in the intake duct downstream of the supercharging air compressor and having a cooling fluid inlet adapted to be connected to a source of cooling fluid and a cooling fluid outlet, a device for preheating the intake air to said engine, said device comprising:

heat exchange apparatus having a heating fluid input for receiving exhaust gases from the engine, a heating fluid output for the exhaust gases, a heated fluid input for receiving intake air for the engine, a heated fluid output for delivering heated intake air to the air intake duct of the engine, and a heat conveying means moving in a closed path of travel adapted to be in heat transfer relation with engine exhaust gases flowing between the heating fluid input and output for one part of the closed path and in heat transfer relation with engine intake air flowing between the heated fluid input and output for another part of the closed path;

a controllable three-way valve located in said exhaust duct and having an outlet connected to said heating fluid input of said heat exchange apparatus; and

means for operating said three-way valve to selectively control the flow of exhaust gases to the heating fluid input of said heat exchange apparatus for heating said heat conveying means in the one part of said closed path.

4,122,680

CONCENTRATION DIFFERENCE ENERGY OPERATED POWER PLANTS AND MEDIA USED IN CONJUNCTION THEREWITH

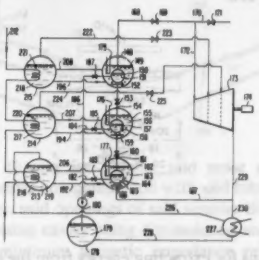
Naotsugu Isshiki, Kyodo; Isao Nikai, and Hiroyuki Uchida, both of Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Nov. 11, 1976, Ser. No. 741,033

Claims priority, application Japan, Nov. 13, 1975, 50-135716; Feb. 25, 1976, 51-18830; May 10, 1976, 51-57243; Jul. 7, 1976, 51-80533; Jul. 7, 1976, 51-80534

Int. Cl.[2] F01K *25/06*

U.S. Cl. 60—649 **6 Claims**



1. A multistage concentration difference energy engine comprising a plurality of aqueous solution tanks each of which includes a pure water boiler, means interconnecting said tanks so that the steam generated in the pure water boiler in the tank of a first stage may be injected through nozzles into the aqueous solution in the tank of an adjacent stage, and the steam generated in the pure water boiler in the last-named tank may be injected through nozzles into the aqueous solution in the tank in the next higher stage, and means for conducting steam generated in the pure water boiler in said tank in said latter stage to a steam engine, means for conducting exhaust steam from the steam engine through nozzles into the aqueous solution in the first stage tank, and means for feeding strong aqueous solution to each of said aqueous solution tanks.

4,122,681

MINE ROOF SUPPORT ASSEMBLY

George S. Vass, Summersville, W. Va., and Gerald M. Speidel, Strongsville, Ohio, assignors to The Eastern Company, Naugatuck, Conn.

Filed Sep. 16, 1977, Ser. No. 833,867

Int. Cl.[2] E21D *21/02*

U.S. Cl. 405—261 **1 Claim**

1. A method of reinforcing a rock formation comprising the steps of:

(a) forming a hollow collar, open at both ends and having coaxial, internal threads extending from both ends toward the center;

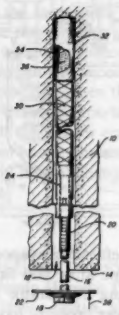
(b) striking the external surface of said collar with a die to cause inward deformation of said internal threads to an extent that a predetermined torque is required to produce relative rotation of said collar and an externally threaded member engaged therewith;

(c) advancing the externally threaded end of an elongated bolt into one end of said collar until the end of the bolt engages said inward thread deformation;

(d) advancing the externally threaded end of an elongated bar into the other end of said collar until fixed stop means prevent further advancement of said bar;

(e) drilling a hole of predetermined dimensions into a face of the rock formation;

(f) inserting a destructible resin cartridge into said hole;
(g) inserting said bar, collar and bolt into said hole behind said cartridge with the bolt head left outside;
(h) rotating the bolt head to cause common rotation of said bolt, collar and bar, thereby fracturing said resin cartridge and mixing the contents thereof within the hole around said bar;



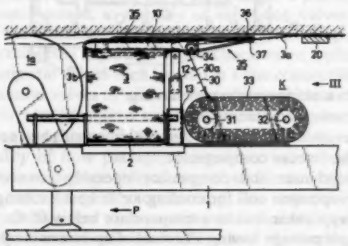
(i) stopping rotation for a period of time sufficient for the resin mixture to harden about said bar, thereby preventing further rotation of said bar and of said collar in a direction tending to advance said bar further into said collar; and
(j) applying to said bolt a torque in excess of said predetermined torque to advance the threaded end of said bolt into said collar past said inward thread deformation and engage the bolt head with structure engaging the face of said rock formation.

4,122,682

METHODS OF AND APPARATUS FOR APPLYING ROOF MATS TO MINE WORKINGS

Karl M. Groetschel, Jakob-Klar-Strasse 5, 8 Munchen 40, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,381
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634557; Dec. 15, 1976, 2656760
Int. Cl.² E21D *19/02*
U.S. Cl. 405—150 **26 Claims**



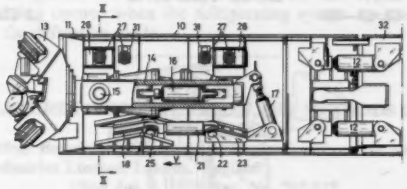
8. Apparatus for applying a flexible mat to the roof of a mine working along a plurality of generally parallel laterally offset paths comprising:
a. mobile means including a body, means thereon for storing a portion of flexible mat while permitting an extended portion to be led off from said stored portion for application to the underface of the roof,
b. applicator means for bringing into proximate relation an edge of the extended portion of mat applied to the roof along each of said paths and an edge of the extended portion of mat applied along the immediately preceding path,
c. means for mechanically fastening said extended portions of mat together adjacent to said edges.

4,122,683

TUNNEL DRIVE SHIELD

Hans G. Follert, Dortmund; Klaus Linde, Lunen, and Hans Jutte, Dortmund-Brechten, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Apr. 8, 1977, Ser. No. 785,891
Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 26152647
Int. Cl.² E01G *3/02*
U.S. Cl. 405—142 **7 Claims**



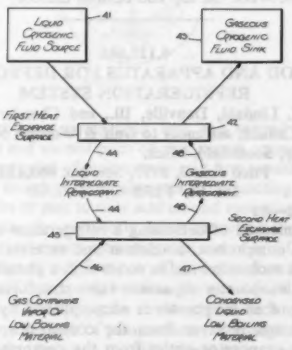
1. In a tunnel drive shield having a plurality of bracing units arranged around its periphery, the bracing units being expansible against the surrounding tunnel wall to control the direction of shield advance, the improvement comprising a bracing unit provided in each shield quadrant defined by the vertical and horizontal center planes of the shield, each bracing unit expansible by control means movable in a non-radial direction, each of said bracing units positioned below the horizontal center plane of the shield controlled by means of a hydraulic ram, said ram having working stroke lying in a direction parallel to the longitudinal axis of the shield.

4,122,684

METHOD FOR THE RECOVERY OF VOLATILE LIQUIDS

Michael J. Clarkson, Penmark, and Robert Duffield, Penarth, both of Wales, assignors to BP Chemicals Limited, London, England

Filed Jun. 28, 1976, Ser. No. 700,556
Claims priority, application United Kingdom, Jul. 23, 1975, 30793/75
Int. Cl.² F17C *7/02*
U.S. Cl. 62—54 **10 Claims**


LIQUID CRYOGENIC FLUID SOURCE
GASEOUS CRYOGENIC FLUID SINK
FIRST HEAT EXCHANGE SURFACE
LIQUID INTERMEDIATE REFRIGERANT
GASEOUS INTERMEDIATE REFRIGERANT
SECOND HEAT EXCHANGE SURFACE
GAS COMPRISING VAPOR OF LOW BOILING MATERIAL
CONDENSED LIQUID LOW BOILING MATERIAL

1. The process for the recovery of a low boiling material present as a vapour in a gas which comprises feeding a bulk cryogenic fluid from a source of liquid cryogenic fluid to a sink of gaseous cryogenic fluid across the first side of a first heat

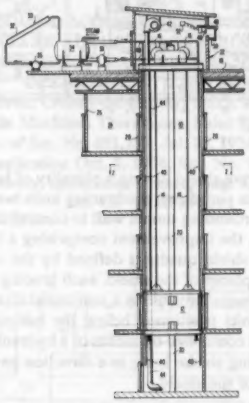
exchange surface through which heat is removed from liquid intermediate refrigerant condensing on the second side of the first heat exchange surface, then passing the condensed liquid intermediate refrigerant, without compressing said refrigerant, to the first side of the second heat exchange surface through which it removes heat into boiling liquid intermediate refrigerant from low boiling materials present as a vapour in a gas, which vapour is condensing as a liquid on the second side of the second heat exchange surface.

4,122,685

ELEVATOR SHAFT

Alonzo W. Ruff, York, Pa., assignor to St. Onge, Ruff & Associates, Inc., York, Pa.

Filed Mar. 29, 1977, Ser. No. 782,453
Int. Cl.² F25D *21/00*
U.S. Cl. 62—80 **2 Claims**



1. A method of modifying an existing cold storage warehouse for frozen commodities having at least one elevator shaft therein to eliminate ice formation within said shaft comprising:
sealing the upper end of said shaft from air and moisture leakage from the ambient atmosphere exterior to the warehouse;
establishing vestibule means enclosing the elevator doors on each floor to minimize transfer of air from the warehouse to the shaft when opening the elevator doors;
adding heat to said shaft to raise the temperature substantially above that of the warehouse interior; and
establishing a recirculating pattern flow of air within said shaft between the top and bottom thereof.

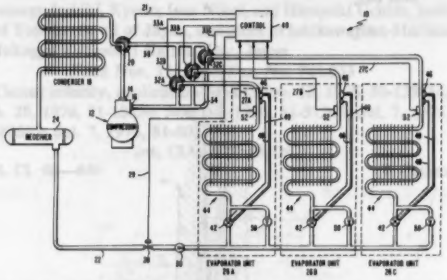
4,122,686

METHOD AND APPARATUS FOR DEFROSTING A REFRIGERATION SYSTEM

Herbert S. Lindahl, Danville, Ill., and Chander Datta, Longueuil, Canada, assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Jun. 3, 1977, Ser. No. 803,121
Int. Cl.² F25B *41/00, 47/00*
U.S. Cl. 62—81 **8 Claims**

1. In a method of defrosting a refrigeration system which includes a compressor, condenser and receiver connected in series with each other and in series with a plurality of parallel connected evaporator expansion valve structures and wherein defrosting of an evaporator is accomplished by isolating the condenser and receiver from the compressor; isolating the defrosting evaporator outlet from the compressor inlet; and passing hot, compressed refrigerant gas directly from the compressor to the evaporator being defrosted while continuing the refrigeration cycle in the remaining evaporator expansion valve structures utilizing liquid refrigerant from the condenser, receiver and from the defrosting evaporator, the improvement comprising:
(a) discontinuing the flow of hot, compressed refrigerant gas to the defrosting evaporator at a predetermined, relatively high pressure, temperature or time;
(b) monitoring the pressure in the defrosting evaporator;



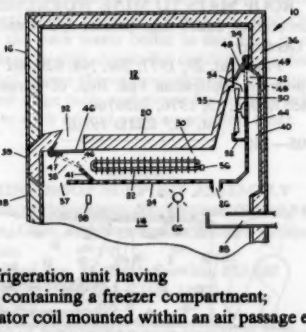
(c) maintaining the defrosting evaporator isolated from the compressor inlet line after said flow of hot, compressed gas to the defrosting evaporator is discontinued until a predetermined, lower pressure has been reached; and
(d) terminating the defrost cycle by re-establishing the connection between the defrosting evaporator outlet and the compressor inlet.

4,122,687

REFRIGERATION SYSTEM WITH LOW ENERGY DEFROST

Thomas M. McKee, 3003 Iroquois Trail, Hastings, Mich. 49058

Division of Ser. No. 749,073, Dec. 9, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,347
Int. Cl.² F25D *21/12*
U.S. Cl. 62—156 **3 Claims**



1. In a refrigeration unit having
a housing containing a freezer compartment;
an evaporator coil mounted within an air passage exterior to the freezer compartment;
a condenser and compressor operably connected to the evaporator coil for cooling air in heat exchange with the evaporator coil to a temperature below 0° C. (32° F.);
the air passage having a first set of apertures in open communication with the freezer compartment and a second set of apertures in open communication with a source of air;
means for circulating air either through the first set of apertures of the passageway so that air flows through the freezer compartment and across the evaporator coil in heat exchange therewith to cool the freezer compartment or through the second set of apertures of the passageway so that air having a temperature above 0° C. flows across the evaporator coils in heat exchange relationship therewith;
valve means for controlling the passage of air through the first and second set of apertures and through the air passageway;

temperature sensitive means mounted within one of the freezer compartment and air passageway for turning off the compressor when a first predetermined temperature is detected and for turning on the compressor when a second predetermined higher temperature is detected; the improvement comprising:

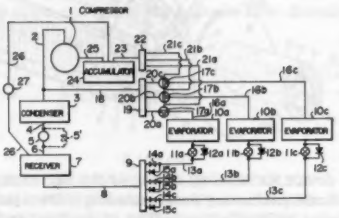
an air duct positioned outside the insulating walls of the freezer space and within the outer shell of the refrigeration unit in communication with the air passage to supply air above 0° C. to the evaporator coils;

means coupled to the temperature sensitive means for controlling the valve means to direct air from the above 0° source to pass through the second set of apertures and across the evaporator coil when the compressor is turned off and to use the first set of apertures to prevent air from circulating through the freezer compartment, the air passage being free from heating means so that the evaporator is defrosted only by heat exchange with the air from the above 0° C. source.

4,122,688
REFRIGERATING SYSTEM

Taketoshi Mochizuki; Fumio Harada; Tadahiro Imaizumi, all of Shimizu, and Koichi Nose, Ashiya, all of Japan, assignors to Hitachi, Ltd. and Shin Meiwa Industry Co., Ltd., both of, Japan

Filed Jul. 19, 1977, Ser. No. 816,938
Claims priority, application Japan, Jul. 30, 1976, 51-90338; Jul. 30, 1976, 51-90340; Mar. 23, 1977, 52-34423[U]
Int. Cl.[2] F25B *41/00, 47/00*
U.S. Cl. 62—196 R 18 Claims



1. A refrigerating system comprising a refrigerant compressor, a condenser, a reservoir for a condensate, a plurality of unit evaporator means, a plurality of expansion valves each located on the condenser side of one of said unit evaporator means and connected in parallel with a check valve, a plurality of electromagnetic valves each located in a line connecting one of said expansion valves to said reservoir for a condensate and connected in parallel with a check valve, a branch line connected at one end thereof to an outlet line of said compressor, and a plurality of flow passage change-over valves each located on the compressor side of one of said unit evaporator means and interchangeably connecting the respective unit evaporator means either to the suction side of said compressor or to the other end of said branch line, said electromagnetic valves being opened and said unit evaporator means being all connected to the suction side of said compressor when the refrigerating system operates in a refrigerating mode and any of the unit evaporator means desired to be defrosted being connected to the other end of said branch line through the associated flow passage changeover valve and the electromagnetic valve belonging to said unit evaporator means in which defrosting is performed being closed when the refrigerating system operates in a defrosting mode, wherein the improvement comprises:

a throttle means for a main refrigerant circuit located in a line of said main circuit connecting said compressor to said reservoir for a condensate in a position downstream of a point of joining of said branch line and said outlet line of said compressor; and

a bypass line connecting an upper portion of said reservoir for a condensate to the suction side of said compressor and mounting therein a throttle means for the bypass line;

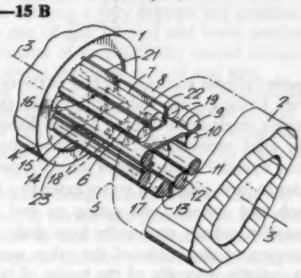
said throttle means for the bypass line being closed and said throttle means for the main refrigerant circuit being opened when the refrigerating system operates in the refrigerating mode;

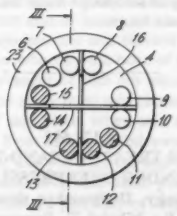
each of said unit evaporator means in which defrosting is desired to be effected being connected directly to said reservoir for a condensate by bypassing the associated expansion valve, the throttle valve means for the main refrigerant circuit having its degree of opening suitably reduced so as to throttle the flow therethrough of the refrigerant and said throttle means for the bypass line being opened when the refrigerating system operates in the defrosting mode.

4,122,689
FLEXURE-PIVOT ASSEMBLIES AND METHODS OF MAKING THEM

Geoffrey Beardmore, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Filed Jul. 6, 1976, Ser. No. 702,827
Claims priority, application United Kingdom, Jul. 3, 1975, 28155/75
Int. Cl.[2] G01C *19/18;* B23P *11/00*
U.S. Cl. 64—15 B 9 Claims





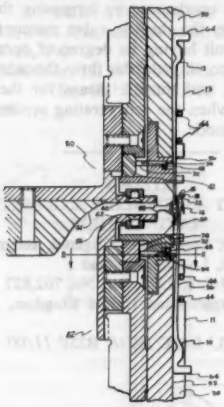
1. A flexure-pivot comprising first and second mounting members; first and second pairs of pins; means connecting said first and second pairs of pins to only said first mounting member; third and fourth pairs of pins; means connecting said third and fourth pairs of pins to only said second mounting member; a first flat spring for resiliently interconnecting the first and third pairs of pins; means mounting one end of said first spring between the pins of said first pair of pins; means mounting the other end of said first spring between the pins of said third pair of pins; a second flat spring for resiliently interconnecting the second and fourth pairs of pins; means mounting one end of said second spring between the pins of said second pair of pins; and means mounting the other end of said second spring between the pins of said fourth pair of pins so that the first and second mounting members are resiliently interconnected for relative angular displacement via said first and second springs.

4,122,690

METHOD AND MEANS FOR TRANSFERRING KNIT LOOPS BETWEEN CYLINDERS OF A DOUBLE CYLINDER KNITTING MACHINE

Battista Moreni, Brescia, Italy, assignor to Speizman Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 815,403, Jul. 13, 1977, abandoned. This application Jul. 25, 1977, Ser. No. 818,417
Claims priority, application Italy, Jul. 30, 1976, 25909 A/76
Int. Cl.[2] D04B 9/10
U.S. Cl. 66—14 10 Claims



1. In a double cylinder knitting machine of the type operable for selectively knitting plain and purl stitches, the improvement comprising single-hook knitting needles disposed on both cylinders for axial reciprocation in a knitting operation the needles in one cylinder being aligned with the needles in the other cylinder to form pairs, and means extending through the walls of each said cylinder and acting on said needles for displacing needles radially outwardly from their cylinders to allow positioning of the hooks of the other needles of the needle pairs radially inwardly of the hooks of the displaced needles for entry into knit loops initially carried on the displaced needles and for receipt of said loops on said other needles upon shedding of said loops from the displaced needles to effect transfer of said loops.

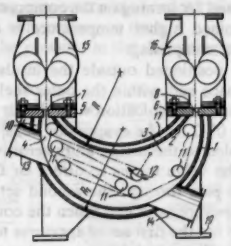
4,122,691

CHAMBER FOR TREATING BAND-TYPE MATERIAL UNDER OVERPRESSURE

Leonid G. Gorodissky, Dmitrovskoe shosse, 153/43, kv. 106, Moscow, U.S.S.R.; Nikolai T. Romanov, deceased, late of Moscow, U.S.S.R., and Anantasia I. by Romanova, administratrix, Bulatnikovsky proezd, 14, korpus 5, kv. 152, Moscow, U.S.S.R.

Filed Sep. 14, 1977, Ser. No. 833,075
Int. Cl.[2] D06B 23/18
U.S. Cl. 68—5 E 2 Claims

1. A chamber for treating a band-type material under overpressure comprising: side walls; an arched bottom; an arched roof hermetically joined with said bottom and side walls and made in such a manner that the chamber has a crescent cross section; flanges secured on said arched bottom, roof and side walls; throats formed by said arched bottom and arched roof and located near said flanges; slotted openings in said flanges, intended for admitting and discharging the band-type material into and out of the chamber; a device for transporting the band-type material; hatches provided for visual inspection and for fitting the band-type material into said material-transport device; gates arranged over said slotted openings and intended



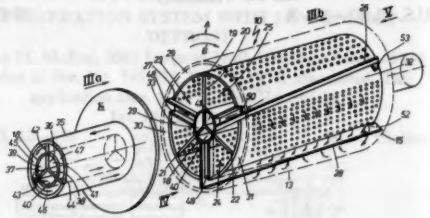
to pass the band-type material and to retain pressure in the chamber at a preset level.

4,122,692

DEVICE FOR TANNING, DYEING OR THE LIKE

Werner Dose, Lindenstrasse 12, D-7585 Lichtenau-Grauelsbaum, Fed. Rep. of Germany

Filed Oct. 13, 1977, Ser. No. 841,803
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648057
Int. Cl.[2] C14C 1/00
U.S. Cl. 69—30 29 Claims



1. A device for tanning, dyeing or the like, comprising
(a) a horizontal rotary drum including a drum jacket having closing walls effecting sealing at the front ends and containing in its interior a tanning or dyeing compartment, which is accessible for loading and unloading via sealable charging openings in the drum jacket,
(b) a hollow shaft, which communicates with the tanning or dyeing compartment, for mounting the drum and for the drainage and/or intake of fluid treatment media,
(c) radial partition walls subdividing said compartment which walls are arranged relative to one another in approximately the same angle displacement into a number of treatment chambers corresponding to the number of radial partition walls, which chambers are of approximately equal size and each comprise a separate sealable charging opening;
(d) the rotary drum comprises, at least approximately in the area of its two frontal ends and in the radial direction, on its exterior a number of pockets corresponding to the number of the treatment chambers, each pocket being in joing communication with respectively two treatment chambers following one another in the circumferential direction;
(e) the hollow shaft penetrates the rotary drum in the centre and in an axially passing manner and extends it at one end, beyond the frontal closing wall and is surrounded by a coaxial pipe socket which is larger in diameter; and
(f) the rotary drum comprises at each axial drum end for each individual treatment chamber an approximately radial connecting line and of which those located at one

frontal drum end open with their one end into the annular space between the hollow shaft and the pipe socket and those located at the opposite drum end open with their one end into the interior of the hollow shaft, while all the connecting lines are connected with their other end to a respectively associated pocket in such a way that respectively two connecting lines located opposite at the front ends of the drum open in respect of each treatment chamber into the pockets located at the same circumferential level or staggered relative to one another in the circumferential direction,

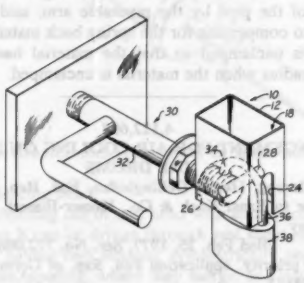
whereby during the rotation of the rotary drum in one direction of rotation the treatment medium emerges approximately radially from a treatment chamber and enters a pocket in the area of one front drum end, flows from this pocket through the connecting line thereof into the annular space between the hollow shaft and the pipe socket and returns therefrom, after deflection and possibly a simultaneous medium treatment, such as heating, concentration check etc., as a partial stream through one of the connecting lines at this drum end into a pocket provided there and through this latter, while being mixed with the treatment medium disposed in this pocket, approximately radially into a treatment chamber; the other partial stream flowing simultaneously through the hollow shaft in the axial direction to the opposite drum end and through a connecting line into an associated pocket being mixed with the treatment medium contained therein, and then flowing from this pocket approximately inwards into the same treatment chamber or one that follows in the direction of rotation and in that during the rotation of the rotary drum in the direction of rotation opposite thereto a corresponding scooping of the treatment medium occurs at the other frontal drum end and in the opposite flow direction.

4,122,693

SHACKLE GUARD FOR PADLOCKS

Rolla W. Barr, 16300 Fontaine Dr., Chesterfield, Mo. 63017

Filed Dec. 12, 1977, Ser. No. 859,309
Int. Cl.² E05B *67/38*
U.S. Cl. 70—56 **15 Claims**



1. A shackle guard for padlocks comprising:

a housing having a cavity in one end thereof, a first relief in the housing adjacent the one end for receiving, into the cavity, a shackle portion of an associated padlock, and a second relief in the housing opposite the first relief and adjacent the one end for receiving, into the cavity, an associated member to be secured by the padlock; and

shackle-securing means connected in the housing for releasably securing the shackle within the cavity.

4,122,694

KEY FOR A CYLINDER LOCK

Heinrich Gretler, Hinwil, Switzerland, assignor to Bauer Kaba AG Sicherheits-Schliessyteme, Switzerland

Filed Sep. 7, 1976, Ser. No. 720,783
Claims priority, application Switzerland, Sep. 11, 1975, 11821/75
Int. Cl.² E05B *19/04, 19/06*
U.S. Cl. 70—406 **8 Claims**

1. A key for use in combination with a cylinder lock of the type having a bore and a movable portion rotatable in said bore to operate the lock, a substantially rectangular key slot in the movable portion, and a plurality of tumbler pins with conical distal ends carried by said movable portion and protruding into said key slot, the key comprising

an elongated blade portion insertable into said key slot, said blade portion having a substantially rectangular cross section with substantially flat sides having a transverse width significantly greater than the diameters of said tumbler pins;

a handle portion;

means for defining a fully inserted key position;

means in one of said sides of said blade portion defining a first plurality of longitudinally spaced elongated recesses for receiving the distal ends of said pins,

each of said recesses having a longitudinal dimension significantly greater than the distal ends of said pins,

each of said recesses being located along said blade in a position to receive one of said pins when said key is in said fully inserted position,

said recesses being formed with at least one sloping end surface to permit said pins to slide into and out of said recesses as said blade is inserted and withdrawn, said sloping end surfaces of said recesses being inclined at an angle of about 45° to the side surface of said blade portion,

the means defining at least one of said recesses being located so that, in said fully inserted position, the pin associated with said at least one recess is received by said recess adjacent the end thereof farthest from said handle portion whereby the bore of said lock limits the extent of movement of said pin associated with said at least one recess away from said recess upon longitudinal movement of said blade when said movable portion is moved away from its key withdrawal position, and the engagement of said pin with the end of said recess limits longitudinal motion of said blade portion; and

means defining a second plurality of longitudinally spaced elongated recesses disposed to receive pins extending into the key slot along a plane inclined at 45° from the first said plurality of recesses,

said recesses being located to receive their respective pins at positions spaced from the ends thereof.

4,122,695

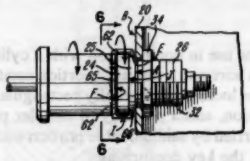
LOCK HEAD PROTECTOR

Mitchell A. Hall, Ft. Thomas, Ky., assignor to Monarch Tool & Manufacturing Company, Covington, Ky.

Filed Sep. 21, 1977, Ser. No. 835,139
Int. Cl.² E05B *15/16*
U.S. Cl. 70—417 **12 Claims**

1. A key-activated cylindrical lock which comprises an elongate substantially cylindrical body portion, said body portion passing through an aperture defined in a panel to be mounted on that panel, an external head on the forward por-

tion of said body portion the diameter of which is greater than the diameter of said body portion, said external head including front, rear and intermediate surfaces, said front surface having a key-receptive opening therein, said rear surface extending outwardly at right angles from said body portion, and said intermediate surface extending between said front and rear surfaces, said external head having peripheral portions thereof abutting a front surface of the panel in which the lock is mounted to prevent the lock from passing inwardly through the panel via the aperture defined therein, a hardened, protective housing for said head, said housing including front, rear and intermediate walls each of which are disposed in overlying relationship with a corresponding surface of the said external



head, said front wall having a key-receptive opening therein, means rotatably securing said housing to said head, and a plurality of hardened ball bearings interposed between corresponding portions of the external head and housing, said ball bearings serving to space portions of the front and intermediate surfaces of the external head from corresponding adjacent portions of the front and intermediate walls of the housing, said ball bearings being disposed in spaced axial alignment with the periphery of the cylindrical body portion of the lock and in axial alignment with sections of said external lock head peripheral portions which must be disfigured in order to pass the lock inwardly through the aperture defined in the panel to dismount the lock from the panel thereby defeating the lock.

4,122,696

METHOD AND APPARATUS FOR MANUFACTURING METALLIC PIPE

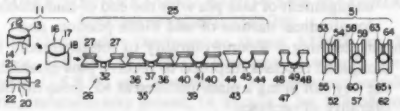
Wataru Midzutani, Kitakyshu; Koe Nakajima, Nakama; Toshio Kikuma, Onga; Keitaku Ondo, Kitakyushu, all of Japan, and assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 21, 1977, Ser. No. 789,716

Claims priority, application Japan, Dec. 13, 1976, 51-149519; Dec. 13, 1976, 51-149520; Dec. 30, 1976, 52-159254; Jan. 17, 1977, 52-3729

Int. Cl.² B21D *39/02, 5/12*

U.S. Cl. 72—52 **16 Claims**



1. In a method for manufacturing a metal pipe wherein a generally flat skelp is formed into an O-shaped cross-section by feeding the skelp in the longitudinal direction thereof through a forming mill having a train of U-shape forming stands, a prefinishing stand and a train of finishing stands, the improvement comprising: providing in the train of forming stands a plurality of pairs of spaced opposed forming rolls along the length of the train with the rolls of each pair symmetrically rotatably mounted on opposite sides of the centerline of the path of the skelp through the forming mill and having profiles with a generally V-shaped recess therein defined by portions of the roll profile having straight lines with the positions of the V-shaped recesses in the rolls of successive pairs of rolls in the direction toward the output end of the forming mill being further around the periphery of the forming stands from the position of the recess in the first forming stand, supplying the generally flat skelp into the train of said forming stands with at most the edge surfaces in line contact with the roll profiles in the bottoms of said recesses and the outer surface of the skelp adjacent the edges in substantially only point contact with the profiles of each of the pairs of the forming rolls in the bottoms of said recesses for holding the skelp so as to apply a bending load to the skelp, the successive pairs of rolls forming the skelp into an increasingly U-shaped skelp.

4,122,697

MEANS AND METHOD FOR REDUCING RADIUS EXPANSION IN THE BENDING OF ELONGATED MATERIALS

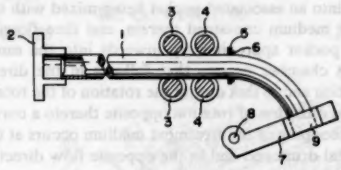
Susumu Hanyo, Yokohama; Jousuke Yamaguchi, Kanagawa; Yoshiyuki Morishita, Tokyo, and Itoshi Noguchi, Kawasaki, all of Japan, assignors to Daiichi Koshuha Kogya Kabushiki Kaisha, Japan

Division of Ser. No. 593,961, Jul. 8, 1975, Pat. No. 4,062,216. This application Jul. 29, 1976, Ser. No. 709,929

Claims priority, application Japan, May 30, 1975, 50-64956

Int. Cl.² B21D *7/16, 7/024*

U.S. Cl. 72—128 **8 Claims**



1. In an apparatus for hot bending elongated materials having an annular heating means for locally heating a limited portion of the material, an arm freely pivotable about an axis in the plane of the heating means, a clamp carried by said arm for engaging a leading portion of the material, and means for continuously advancing the material through said heating means and guiding the trailing, unbent portion of the material, the improvement wherein said advancing and guiding means is operative to maintain the longitudinal axis of the unbent portion of the elongated material at an acute angle with respect to a perpendicular to the plane of the heating means during the bending of the pipe by the pivotable arm, said angle being selected to compensate for the spring back material when the material is unclamped so that the material has the desired bending radius when the material is unclamped.

4,122,698

ARRANGEMENT FOR AIR COOLING ON DRAWING DIE DRUMS

Günter Herzog, Hemer-Deilinghofen, Fed. Rep. of Germany, assignor to Ernst Koch & Co., Hemer-Ihmert, Fed. Rep. of Germany

Filed Feb. 25, 1977, Ser. No. 772,006

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2628173

Int. Cl.² B21C *9/00, 1/02*

U.S. Cl. 72—286 **8 Claims**

1. An arrangement for air cooling on drawing die drums, comprising

at least one drawing die drum,

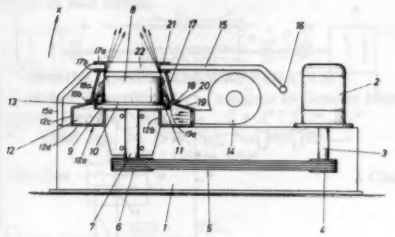
a member having an inner wall and an outer wall of substantially the same height concentrically oriented and connected to each other at a bottom portion thereof, said member including an upwardly inwardly extending annular chamber wall connected to the top of said outer wall,

said walls defining an annular chamber connected with a source of cooling air,

a pivotally mounted protective screen laterally covering said drawing die drum and forming an upper exit opening above the latter,

said drawing die drum having a lower flanged end mounted above said inner wall and extending radially outwardly relative thereto extending into said annular chamber, said upwardly inwardly extending annular chamber wall having a free end pointing to and adjacent to an upper portion of said flanged end of said drawing die drum and forming therewith an air exit — annular gap,

at least one tube section being mounted and secured on said protective screen operatively disposed concentrically around said drawing die drum and having the form of a downwardly widening truncated cone, said tube section spans across substantially the entire spacing between said air exit — annular gap and said protective screen.

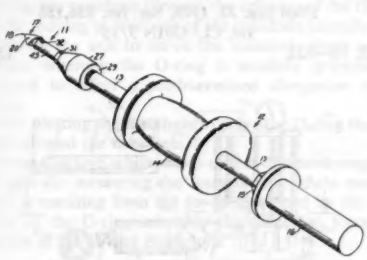


4,122,699

TOOL FOR REMOVING DENTS FROM SHEET METAL

Cletus R. Logsdon, 530 S. Sage, Rialto, Calif. 92376

Filed Sep. 6, 1977, Ser. No. 830,674
Int. Cl.² B21D *1/12, 31/02*
U.S. Cl. 72—325 **7 Claims**



1. In a device for removing dents in sheet metal, a tool comprising:

a metal piercing head,

means permitting use of said head with an impacting device whereby it can be driven through said sheet metal,

said head having two integral, symmetrically opposite narrow sides tapering, where they merge, to a pointed metal piercing tip,

said head also having two integral, symmetrically opposite broad sides tapering, where they merge, toward said tip,

said broad sides converging along their side edges to form metal shearing ridges extending along the length of said head, and

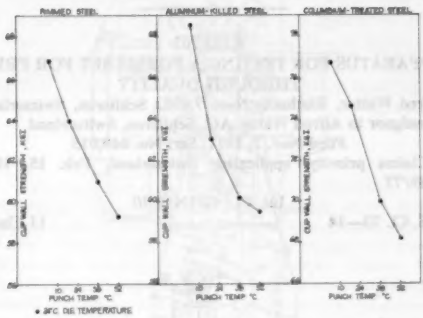
said broad side being convex in cross-section throughout whereby said head forms a double cuspid opening with inturned lips in said sheet metal when driven therethrough by means of said impacting device.

4,122,700

PROCESS FOR FORMING SHEET METAL STOCK

Wayne G. Granzow, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Continuation-in-part of Ser. No. 719,950, Sep. 2, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,195
Int. Cl.² B21D *22/20*
U.S. Cl. 72—342 **5 Claims**



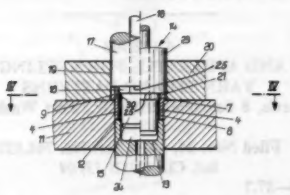
1. In a process for forming sheet metal in thicknesses up to about 6.5mm of a type exhibiting yield strength and tensile strength sensitivity to small changes in temperature under ambient conditions, wherein a sheet metal workpiece at room temperature is engaged between a concave die and a mating convex punch which are caused to move relative to one another whereby to draw said workpiece, by direct contact with said punch, into the internal configuration of said die, the improvement which comprises selectively cooling those areas of said workpiece to remove adiabatic heat from those critical areas of said workpiece susceptible to breakage.

4,122,701

COLLAR SLEEVES AND PROCESS AND TOOL FOR THE MANUFACTURE THEREOF

Dieter Lehnhart, Mainz, Rhein, Germany, assignor to Glyco-Metall-Werke Daelen & Loos GmbH, Wiesbaden-Schierstein, Germany

Division of Ser. No. 549,953, Feb. 14, 1975, Pat. No. 4,048,703. This application May 4, 1977, Ser. No. 793,717
Int. Cl.² B21D *22/00*
U.S. Cl. 72—354 **5 Claims**



1. A tool for shaping collars to sleeves and simultaneously calibrating each sleeve body in manufacturing collar sleeves, comprising die means providing a first cylindrical bore, adapted to form an outer cylindrical calibration surface, and a coaxial larger diameter second clyindrical bore, a first die part extending into said first bore and having an axial face to engage one end of a prepared cylindrical sleeve of uniform radial thickness inserted into said first bore with its other end projecting into said second bore, and a second die part slidable in said second bore having an external axially extending cylindrical counter die surface of smaller diameter than said second die part extending around within the inner surface of said sleeve and being adapted to form an inner cylindrical calibration

surface coaxial with said outer cylindrical calibration surface to confine the sleeve under upsetting deformation between the said coaxial cylindrical calibration surfaces, said second die part having an axial face extending laterally outwardly from said counter die surface and adapted for abutting said other end of said sleeve, and means for relatively axially moving said die parts together with upsetting pressure whereby said projecting other end of said sleeve is increased in radial thickness within said second bore to form said collar.

4,122,702

APPARATUS FOR TESTING A FORMS SET FOR PRINT THROUGH QUALITY

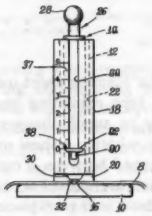
Alfred Walter, Rietbachstrasse 7,8952 Schlieren, Switzerland, assignor to Alfred Walter AG, Schlieren, Switzerland

Filed Nov. 7, 1977, Ser. No. 849,015

Claims priority, application Switzerland, Feb. 15, 1977, 1869/77

Int. Cl.² G01N *3/30*

U.S. Cl. 73—14 **11 Claims**



1. Apparatus for testing the print through quality of a forms set comprising a base plate adapted to receive the forms set thereon, a hammer, means disposed above said base plate for guiding said hammer for vertical movement to and from a position where the lower face of said hammer strikes the forms set, means for releasably locking said hammer at a plurality of heights above said base plate, the hammer being free falling in said guide means when released by said locking means from each of said heights, and a raised test sign disposed on either the face of said hammer or on the upper surface of the base plate below said face of said hammer, whereby gravity causes said hammer upon being released from a selected one of said heights to drop until the lower face of said hammer strikes the forms set to cause the impression of said test sign to be made on copies included in the forms set.

4,122,703

METHOD AND APPARATUS FOR REELING DISCRETE YARN STRAND PATTERNS

Jesse B. Davis, 8 Sagamore Hill Dr., Port Washington, N.Y. 11050

Filed Nov. 24, 1976, Ser. No. 744,527

Int. Cl.² G01B *13/04*

U.S. Cl. 73—37.7 **7 Claims**

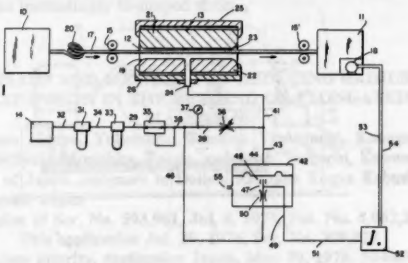
1. Yarn grading apparatus for monitoring a moving yarn line comprising one or more discrete strands to assure the denier consistency thereof, the apparatus including:

means forming an elongated sensing passage of sufficient cross sectional opening to closely surround a segment of said moving yarn line, whereby to define an elongated annular chamber between said yarn line and the walls of said sensing passage when said line segment is registered within said elongated sensing passage,

said means forming a sensing passage including a holder comprising elongated upper and lower members being pivotally engaged along a mutual edge thereof to permit pivotal movement of the respective members between open and closed positions, each of said upper and lower members having a cavity therein disposed in contiguous relationship when said respective members are in the closed position,

passage defining inserts (21 and 22) removably positioned within the respective cavities whereby to define said elongated sensing passage about said yarn line when the holder is in the closed position,

a source of sensing fluid including at least one conduit communicating said sensing fluid source with said elongated annular chamber to introduce a controlled flow of sensing



fluid to the latter, whereby to establish a fluid back pressure within said at least one conduit and said annular chamber as a result of the fluid flow resistance characteristics exhibited by said annular chamber, and

monitoring means communicated with said at least one conduit, being sensitive to the occurrence of variations in the magnitude of the said fluid back pressure, which occur in response to a change in fluid flow resistance within said annular chamber.

4,122,704

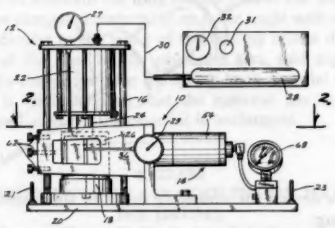
PORTABLE VARIABLE EXPANSION TESTING DEVICE FOR MEASURING LATERAL PRESSURE INDUCED ON A MATERIAL BY A VERTICAL APPLIED PRESSURE

Alan J. Lutenegger; Richard L. Handy, and James M. Hoover, Ames, Ala.L OF IA, assignors to Iowa State University Research Foundation, Ames, all of, Iowa

Filed Sep. 23, 1978, Ser. No. 836,153

Int. Cl.² G01N *3/10*

U.S. Cl. 73—822 **13 Claims**



1. A testing device to measure the lateral pressure induced on a material by a vertical applied pressure, said testing device comprising in combination,

a support means,

a material holding receptacle operatively mounted on said support means which is capable of lateral expansion in response to a vertical applied force on a material contained in said receptacle,

said receptacle being an elastic, cylindrical sleeve having a vertical slit along its entire length to define first and second vertical edge portions,

means retaining said first vertical edge portion against lateral movement upon said vertical applied pressure being applied to said material in said sleeve,

at least one lateral pressure cylinder means comprising a cylinder body having a movable piston therein, a cylinder rod connected to said piston and extending from said body and being operatively connected to said second vertical edge portion,

and a fluid pressure gauge operatively connected to said cylinder body for sensing and indicating pressure created in said second vertical edge portion being laterally deflected with respect to said first vertical edge portion when said vertical applied pressure is applied to said material in said sleeve.

4,122,705

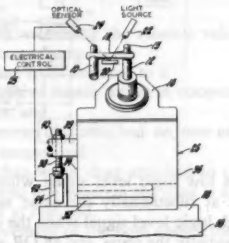
O-RING INSPECTION APPARATUS

Herbert E. Rober, Roseville, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1977, Ser. No. 809,790

Int. Cl.[2] G01N *3/08*

U.S. Cl. 73—794 **2 Claims**



1. An apparatus for dynamically measuring the elasticity of O-rings formed of elastomeric material comprising,

a pair of spaced mandrels, each rotatably mounted in a support, the mandrels being crossed at an angle,

means for presenting an O-ring to a position adjacent the mandrels with the O-ring axis aligned with the mandrels,

means moving the mandrels generally along said axis for inserting the mandrels through the opening of the O-ring,

means for moving at least one of the mandrels laterally with respect to the axis to move the mandrels apart a fixed distance whereby the O-ring is securely gripped and stretched to effect a predetermined elongation of the O-ring,

means for rotating the mandrels to drive the O-ring through a path around the mandrels,

and means effective while the O-ring is driven through the said path for measuring the force on one of the mandrel supports resulting from the force developed by the elongation of the O-ring whereby the measured force is a measure of the O-ring elasticity.

4,122,706

APPARATUS FOR COMPUTING THE MEAN INDICATED PRESSURE OF AN ENGINE

Oluf R. Schmidt, Kastrup, Denmark, assignor to Als Burmeister & Wain's Motor-OG Maskinfabrik AF 1971, Copenhagen, Denmark

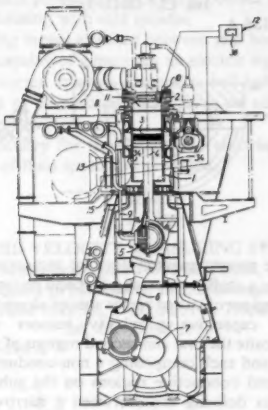
Filed Jul. 12, 1977, Ser. No. 814,891

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632470

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—115 **9 Claims**

1. In an apparatus for measuring instantaneous values of pressure in the cylinders of a reciprocating engine and for computing the mean indicated pressure by integration of the pressure as a function of the piston travel; the apparatus including transducer means for sensing said pressure at moments determined by sensor means cooperating with markings provided on a part of the drive system of the engine and electronic calculator means to which said transducer means and said sensor means are coupled, the improvement comprising a set of markings provided for each cylinder in said engine, said markings being provided on a part (9) of the engine rigidly connected to the piston (3) belonging to the cylinder and which effects a reciprocating movement synchronous with the movement of the piston and said markings substantially covering only that part of the piston travel in which the pressure in the cylinder changes appreciably.



4,122,707

FLOW TEST STAND

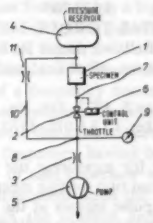
Ernst Leunig, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,565

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1976, 2630521

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—118 R **6 Claims**



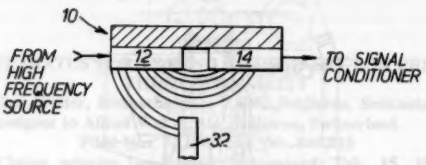
1. In a flow test stand for measuring the flow cross-section of a specimen wherein a fluid medium successively flows through the specimen and a test nozzle having a constant flow cross-section, said specimen having fluid characteristic quantities comprising outlet pressure and flow volume being related over a first characteristic curve, said test nozzle having fluid characteristic quantities comprising inlet pressure and flow volume being related over a second characteristic curve, the improvement wherein there is provided a variable flow section nozzle arranged in a fluid path bypassing said specimen for varying the flow volume through said test nozzle with respect to the flow volume through said specimen.

4,122,708

CAPACITIVE PROXIMITY SENSORS

Lawrence C. Maier, Middlebury, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,481
Int. Cl.[2] G01L 3/10
U.S. Cl. 73—136 A 5 Claims



5. A torque measurement system for measuring the torque transmitted by a shaft, comprising first and second electrically conductive regions of varied radius spaced along the shaft, first and second capacitive proximity sensors non-rotatably mounted opposite the first and second regions of varied radius, respectively, and each comprising a non-conductive substrate and two spaced conductive regions on the substrate having opposed edges defining therebetween a narrow gap across which electric flux lines fringe outwards from the substrate into the path of the corresponding varied radius region when a potential is applied between the conductive regions, high frequency source means connected to supply an alternating potential to one said non-conductive region of each sensor, first and second signal conditioners connected to the other said conductive region of the first and second sensors, respectively, whereby to produce respective output signals modulated in dependence upon the degree of shielding of the flux lines extending between the conductive regions of their corresponding sensors by the varied radius regions associated with those sensors, each said signal conditioner being remotely located from its associated sensor and comprising means for maintaining said other region of the sensor at virtual ground, whereby to eliminate errors due to cabling capacitance between the sensor and signal conditioner, and comparator means connected to receive and compare said modulated output signals, whereby to produce a signal indicative of the relative phase of the modulated signals, said relative phase being a function of the shaft twist between said varied radius regions and thereby representative of the torque transmitted by the shaft.

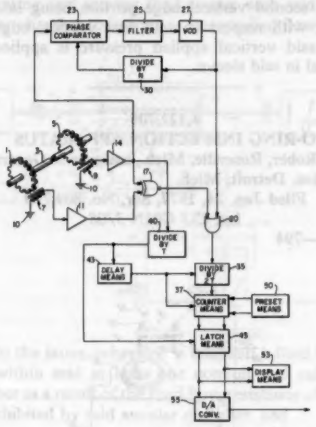
4,122,709

DIGITAL TORQUE METER

Winthrop K. Brown, Bellaire; James R. Bridges, and Kerry D. Savage, both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 5, 1977, Ser. No. 794,284
Int. Cl.[2] G01L 3/10
U.S. Cl. 73—136 A 5 Claims

1. A torque meter for measuring the torque of a rotating shaft comprising at least two sensing means affixed to the shaft and providing shaft pulse signals at the same frequency but having a phase difference corresponding to the torque of the shaft, each sensing means includes a wheel mounted on the shaft having T number of teeth, and coil means placed adjacent to the wheel for providing a pulse each time a tooth on the wheel passes the coil means; clock pulse means for providing clock pulses, said clock pulse means includes phase comparator means connected to one of the coil means and receiving its shaft pulse signal, first divider means connected to the phase comparator means for providing pulses at a rate of one pulse for every N pulses it receives, said phase comparator means providing a voltage output in accordance with the phase comparison, means for filtering the voltage from the phase comparator means to provide a filtered voltage, and a voltage-controlled oscillator connected to the filter means and to the first divider means for providing the clock pulses in accordance with the filtered voltage to the first divider means; and circuit means connected to the two coil means and to said clock pulse means for providing groups of clock pulses in accordance with the shaft pulses so that the number of clock pulses in each group corresponds to the torque of the shaft, said circuit means includes an exclusive NOR gate connected to the coil means



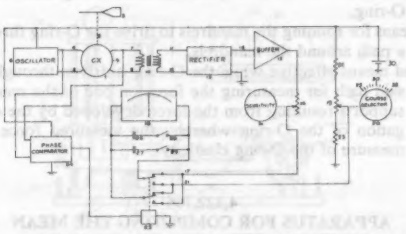
for providing a low logic level signal when the shaft pulse signals are not at substantially the same amplitude and for providing a high logic level signal when the shaft pulse amplitudes are substantially the same, and an OR gate connected to the exclusive NOR gate and to the voltage controlled oscillator for providing the groups of clock pulses in accordance with the signal from the exclusive NOR gate.

4,122,710

COURSE TO WIND GUIDANCE DEVICE

Ian V. Meller, 200 Rideau Ter., Apt. 617, Ottawa, Ontario, Canada

Filed Dec. 1, 1977, Ser. No. 856,686
Int. Cl.[2] G01C 21/00
U.S. Cl. 73—178 R 8 Claims



1. A device for providing to a helmsman of a sailing vessel an indication of deviations of the heading of the vessel from a selected angle with respect to the apparent wind on both port and starboard tacks comprising means for producing an electrical control signal having an amplitude proportional to deviations in angular position of a rotatable shaft from a central position, a wind vane mounted on said shaft and exposed to the wind whereby the angular position of said shaft is determined by said wind vane, dial means for setting said selected angle and for producing a reference electrical signal having an amplitude proportional to the selected angle, means for connecting the control signal and the reference signal in opposition through a meter having a pointer which produces an indication for the helmsman of any difference between them, sensing

means for sensing port and starboard tacks and switching means responsive to said sensing means for reversing connections to the meter on port tacks as compared to starboard tacks so that a single dial setting results in correct meter readings on both port and starboard tacks.

4,122,711
DRAG FORCE KNOTMETER

Howard D. Irwin, 718 Ambleside Dr., Wilmington, Del. 19808

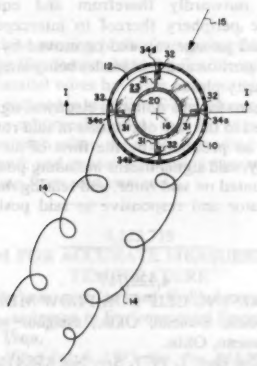
Filed Dec. 29, 1977, Ser. No. 865,532
Int. Cl.² G01C *21/10*
U.S. Cl. 73—184 **5 Claims**

1. A device for measuring the relative velocity between a boat and water comprising:
(a) a flexible line from the boat to a
(b) force-responsive means acting in cooperation with indicating means, and
(c) an elastomeric line attached on one end to the force responsible means, and
(d) a heavier-than-water drag attached to the other end of the elastomeric line wherein the drag is a stiff rod with a circular disk at one end,
whereby the movement of the boat causes the water to exert force on the drag which is transmitted to the force responsive means thereby measuring the relative speed of the boat.

4,122,712
FLUID VELOCITY MEASURING DEVICE

David F. Thomas, Jr., and Leon A. Williams, Jr., both of Hampton, Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 30, 1977, Ser. No. 856,461
Int. Cl.² G01F *1/32*
U.S. Cl. 73—189 **7 Claims**

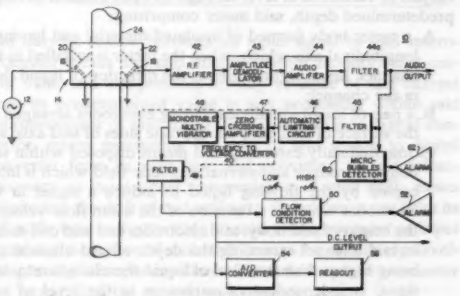


1. A fluid velocity measuring device positionable in a freestream of fluid flow to cause vortices to be shedded therefrom at a frequency proportional to fluid flow speed, said device comprising:
a housing mounted on a spindle;
said housing being capable of oscillatory rotary motion about said spindle induced by, and at a frequency indicative of, the periodic shedding of vortices therefrom; said housing being further capable of translational motion relative to said spindle induced by, and indicative of the direction of, said freestream fluid flow;
said spindle fixable at one end to a reference structure and extending into said housing;
bearing means providing low friction contact and alignment of said housing with said spindle;
force sensing means attached between said housing and said spindle capable of generating an electric signal indicative of said vortex creation frequency and indicative of the direction of translational drag force on said housing by said fluid flow; and
electric circuitry for translating said electric signal into a readout of fluid speed and direction.

4,122,713
LIQUID VELOCITY MEASURING SYSTEM

Peter Stasz, Minneapolis, and Floyd R. Patten, Stacy, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed May 19, 1977, Ser. No. 798,670
Int. Cl.² G01F *1/66*
U.S. Cl. 73—194 A **12 Claims**

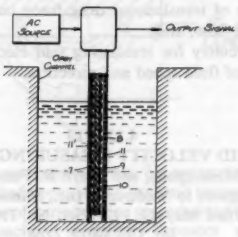


1. An ultrasonic wave system for measuring the characteristics of a liquid flowing through a conduit, said system comprising:
(a) first and second transducer elements operatively associated with the conduit for respectively transmitting an ultrasonic wave into the liquid flowing through the conduit and for receiving an ultrasonic wave backscattered by the liquid directed through the conduit;
(b) generator means for applying a high-frequency signal to said first transducer element causing it to emit the ultrasonic wave into the liquid;
(c) said second transducer element providing an electrical output signal of a frequency corresponding to that high frequency of said generator means, amplitude-modulated in accordance with the backscattered signal derived from the liquid, the frequency having been shifted from that high frequency of said generator means by the Doppler phenomenon, dependent upon the velocity of the liquid directed through the conduit and whose amplitude is dependent on the acoustic impedance of the liquid;
(d) first means coupled to receive the electrical output of said second transducer element for providing an amplitude demodulated output signal, bearing frequency components of the shifted frequency;
(e) second means responsive to an increase in the amplitude output of said demodulating means for providing an alarm manifestation indicating an increase in the acoustic impedance due to presence of gaseous bubbles within the liquid directed through the conduit; and
(f) third means coupled to receive the output signal of said first means and responsive to the frequency shift for providing a manifestation of the rate of the liquid flow.

4,122,714
MAGNETIC CURRENT METER FOR OPEN CHANNEL FLOW MEASUREMENT

Tamotsu Kobayashi, and Jun Futamura, both of Yokohama, Japan, assignors to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Oct. 27, 1977, Ser. No. 846,204
Int. Cl.[2] G01F 1/58
U.S. Cl. 73—194 EM 8 Claims



1. A magnetic current meter to sense the flow of liquid subject to variations in level through an open channel having a predetermined depth, said meter comprising:

A. a meter body formed of insulated material and having a longitudinal axis which, when the meter is installed in the channel, lies at right angles to the direction of liquid flow in the channel;

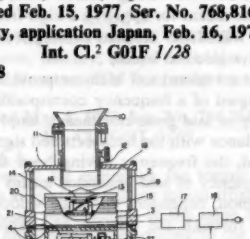
B. a pair of longitudinally-extending electrodes arranged on the surface of said body on opposite sides of said axis; and

C. longitudinally-extending coil means disposed within said body to produce an external magnetic field which is intercepted by the flowing liquid to induce a signal in the electrodes which is a function of the mean flow velocity, the height of said body, said electrodes and said coil means in said channel exceeding the depth of said channel and being higher than the level of liquid therein whereby said signal is independent of variations in the level of said liquid.

4,122,715
APPARATUS FOR MEASURING FLOW RATE OF POWDERY AND/OR GRANULAR MATERIAL

Tohei Yokoyama, Toyonaka, and Kiyoshi Urayama, Kyoto, both of Japan, assignors to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho, Osaka, Japan

Filed Feb. 15, 1977, Ser. No. 768,816
Claims priority, application Japan, Feb. 16, 1976, 51-16287
Int. Cl.[2] G01F 1/28
U.S. Cl. 73—228 5 Claims



1. Apparatus for measuring the flow rate of gravitationally falling powdered or granular material comprising:

a housing;

loading table means within said housing for temporarily supporting the material;

means for feeding material to said table means;

means for vibrating said table to cause continuous flow of material over at least two areas of the peripheral portion of said table to establish free falling streams of the material within said housing;

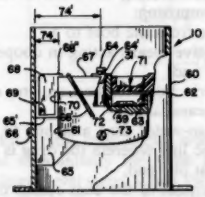
at least two deflector means below said table means within said housing, symmetrically mounted for rotation around a vertical axis passing through the center of said table means and positioned to be impinged on by the falling material which exerts a moment of rotation thereto around said axis; and

measuring means responsive to the value of said moment of rotation for indicating the flow rate of the material.

4,122,716
AIR FLOW TRANSDUCER

Jack C. Priegel, El Paso, Tex., assignor to Autotronic Controls Corporation, El Paso, Tex.

Division of Ser. No. 724,073, Sep. 17, 1976, which is a continuation of Ser. No. 470,566, May 16, 1974, abandoned, which is a division of Ser. No. 122,933, Mar. 10, 1971, Pat. No. 3,817,225. This application Jun. 2, 1977, Ser. No. 802,650
Int. Cl.[2] G01F 1/115
U.S. Cl. 73—231 R 5 Claims



1. An air-flow transducer for measuring the rate of air flow into the intake manifold of an internal combustion engine, said transducer comprising:

a housing forming a substantially straight passageway of substantially circular cross section,

means for mounting said housing to pass the air flowing to said intake manifold through said passageway,

a stator fixedly mounted in respect to said housing;

a rotor mounted within said passageway for rotation relative to said stator about the axis of said passageway, said rotor having a main body portion with a plurality of blades extending outwardly therefrom and equally spaced around the periphery thereof to intercept air flowing through said passageway and be moved by said air, said main body portion and said blades being integrally formed of low density plastic,

and signal means for providing an electrical signal systematically related to the rate of rotation of said rotor relative to said stator as produced by the flow of air through said passageway, said signal means including position marking means mounted on said rotor, and sensing means mounted on said stator and responsive to said position marking means.

4,122,717
RETAINING CLIP FOR FLOW METER

Stanley B. Loesch, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Dec. 1, 1977, Ser. No. 856,476
Int. Cl.[2] G01F 1/115
U.S. Cl. 73—231 R 37 Claims

1. A fluid flow straightening device comprising:

a hollow housing having a recessed area extending about a portion of the interior surface of said hollow housing and through only a portion of the thickness of said hollow housing;

fluid flow straightening means having a recessed area in the exterior surface of said fluid flow straightening means; and

fastening means having a portion inserted in the area formed when said recessed area in said hollow housing and said recessed area in said fluid flow straightening means are aligned while the remaining portion of said fastening

means substantially conforms to said exterior surface of said fluid flow straightening means thereby preventing both longitudinal and rotational movement of said fluid flow straightening means in said hollow housing.

4,122,718

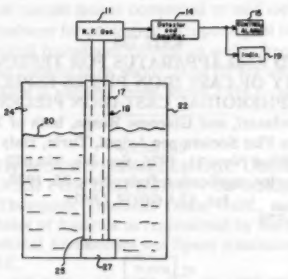
LIQUID LEVEL SENSOR

Reuben V. Gustafson, 228 W. 17th St., New York, N.Y. 10011

Continuation-in-part of Ser. No. 596,511, Jul. 16, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,823

Int. Cl.[2] G01F *23/26*

U.S. Cl. 73—304 C **17 Claims**



1. A capacitive sensing probe for sensing the depth of liquid in a tank or the like comprising a flat flexible cable made of first and second parallel wires having a constant spacing of at least one half inch encased in modified ETFE fluoroplastic, with the one end of the cable sealed off so that the wires at said end are insulated from each other, the wires extending out of the cable at the other end; and capacitive sensing means coupled to the wires extending from said one end.

4,122,719

SYSTEM FOR ACCURATE MEASUREMENT OF TEMPERATURE

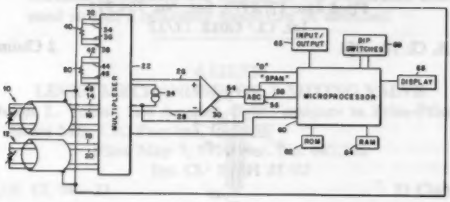
Thomas B. Carlson, and Gerhard Kreikebaum, both of Knoxville, Tenn., assignors to Environmental Systems Corporation, Knoxville, Tenn.

Filed Jul. 8, 1977, Ser. No. 813,951

Int. Cl.[2] G01K *7/10*

U.S. Cl. 73—342 **5 Claims**

5. A system for accurate temperature measurement comprising in combination a platinum resistance whose electrical resistance varies with its temperature, a source of relatively constant current of a predetermined known value, at least two electrical leads connecting said platinum resistance in series with said current source, amplifier means, at least two electrical leads connecting said platinum resistance in electrical communication with said amplifier means whereby when said constant current is impressed through said platinum resistance an electrical signal is developed that has a voltage value proportional to the value of said constant current times the then existing resistance value of said platinum resistance and said altered electrical signal is fed to said amplifier and amplified to develop an output signal in analog form, an analog to digital convertor means, means connecting said amplifier in electrical communication with said analog to digital convertor means, microprocessor means, means connecting said analog to digital convertor means in electrical communication with said microprocessor means in electrical communication with said display means, means electrically connecting said source of constant current to said microprocessor means whereby the value of



said current source becomes an input signal to said microprocessor means and said microprocessor monitors said current value and compensates for any variance of said current from its predetermined value in any processing within said microprocessor of said signal from said analog to digital convertor, means monitoring the drift of said analog to digital converter from its zero base and providing to said microprocessor an input signal representative of such drift, means monitoring the drift of said analog to digital convertor from its full scale base and providing to said microprocessor an input signal representative of such drift, means for selectively developing a digital representation of a variable probe parameter and introducing the same to said microprocessor.

4,122,720

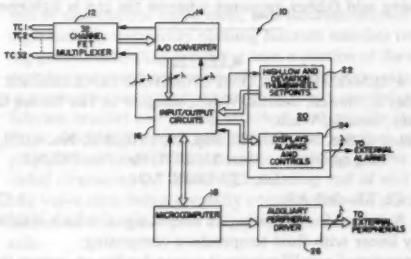
DIESEL ENGINE EXHAUST TEMPERATURE MONITOR

William J. Podl, Hanover Park, Ill., assignor to Alnor Instrument Company, Niles, Ill.

Filed Apr. 7, 1977, Ser. No. 785,505

Int. Cl.[2] G01K *7/04;* **F02B** *77/08*

U.S. Cl. 73—346 **11 Claims**



1. A monitoring system for monitoring the operation of a diesel engine, said engine including a plurality of cylinders, each cylinder having a cylinder exhaust through which the cylinder gases are exhausted, comprising:

a plurality of thermocouples one coupled to each cylinder exhaust to develop an analog signal proportional to the engine exhaust gas temperature of each cylinder;

means for converting said analog signal to a digital signal representative of said temperature and including means for checking for an open thermocouple;

switching means for coupling each of said thermocouple analog signals to said converting means one at a time; and

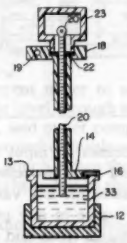
control means coupled to said converting means including means for storing each digital signal from each cylinder, means for numerically taking the average of the total of the latest stored digital signal from each cylinder and excluding any signal from an open thermocouple, and means for comparing each digital signal with said average and for determining if each signal is within a predetermined amount above and below said average.

4,122,721

WATER SAMPLING BUCKET

Theodore Zubricki, 30 Sanger St., Braintree, Mass. 02184

Filed Jan. 17, 1977, Ser. No. 754,971
Int. Cl.[2] G01K *13/12*
U.S. Cl. 73—354 **2 Claims**



1. A water sampling bucket comprising, a plastic bucket for receiving water samples, a rubber sheath for encasing the bottom of the bucket to protect it from impact, a thin extended shaft for holding said bucket upright, said shaft affixed said bucket at multiple concentric points permitting the free entry of water into said bucket, said shaft having means for receiving a line to enable said device to be thrown into the water to pick up a sample of water, said shaft having an open slot along its length, a thermometer, means for holding said thermometer concentric said shaft whereby the bulb of said thermometer is spacially placed mid center in said bucket for measuring water temperature, wherein said thermometer holding means includes a soft rubber grommet for encircling said thermometer, a threaded cap with a concentric opening to receive said grometted thermometer, said shaft having a threaded concentric opening for receiving said threaded cap and a shoulder for pressing said rubber grommet wherein the cap is tightened.

4,122,722

ANEMOMETER COMPENSATOR LINEARIZER

Stanley E. Newell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 727,508, Sep. 28, 1976, Pat. No. 4,070,908.
This application Mar. 31, 1977, Ser. No. 783,361
Int. Cl.[2] G01K *7/24*
U.S. Cl. 73—362 AR **1 Claim**

1. A system for providing an output signal which is substantially linear with fluid temperature comprising:

operational amplifier circuit means having an output terminal;

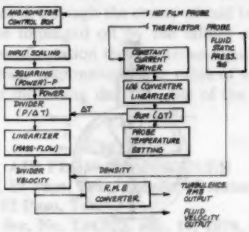
a thermistor probe having a resistance which is an exponential function of fluid temperature;

said thermistor resistance connected in feedback path with said operational amplifier circuit means;

log converter circuit means coupled to said output terminal of said operational amplifier circuit means for providing said output signal which is substantially linear with fluid temperature;

a hot probe temperature setting potentiometer having a volts-per-degree temperature sensitivity equal to the volts-per-degree temperature sensitivity of said output signal; and,

summing amplifier circuit means responsive to said output



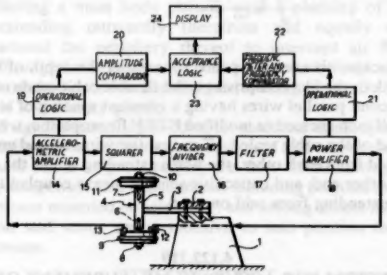
signal and connected to said probe temperature setting potentiometer for providing a signal voltage representative of the difference between hot probe operating temperature and the fluid temperature.

4,122,723

METHOD AND APPARATUS FOR TESTING THE QUALITY OF CAST IRON PIECES ESPECIALLY SPHEROIDAL CAST-IRON PIECES

Giannetto Levizzari, and Giacomo Ruspa, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Nov. 11, 1976, Ser. No. 741,072
Claims priority, application Italy, Nov. 25, 1975, 69903 A/75
Int. Cl.[2] G01H *13/00*
U.S. Cl. 73—579 **5 Claims**



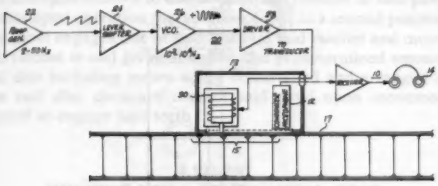
1. A method of testing the quality of cast iron pieces comprising the steps of mechanically coupling together in a mechanical oscillatory system a piece to be tested and a reference piece having the same form and geometry as the piece to be tested, oscillating the said system at resonance, obtaining signals representing the frequency and resonance amplitude of the oscillating system, and utilizing said signals to provide an indication of the quality of the piece to be tested by comparing said signals with the same signals obtained with two reference pieces having different degrees of acceptability, one of said reference pieces representing a lower limit of acceptability, and wherein the test piece is substituted for said one reference piece.

4,122,724

SWEPT FREQUENCY AUDIBLE BOND TESTER

Glenn A. Geithman, Renton, and Wayne E. Woodmansee, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 24, 1977, Ser. No. 809,871
Int. Cl.[2] G01N 29/04
U.S. Cl. 73—588 2 Claims



1. Apparatus for sonic inspection of a work piece comprising:

a receiving transducer element comprising a condenser microphone adapted to be positioned in acoustically coupled relationship to the work piece;

receiver circuit means connected to said condenser microphone for providing an audio output signal having a vibrational spectrum responsive to detection of a flaw condition in said work piece;

a transmitting transducer element comprising an electromechanical transducer adapted to be positioned in acoustically coupled relationship to the work piece; and,

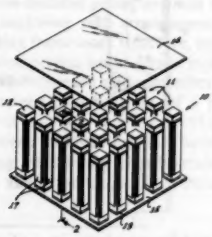
transmitter circuit means connected to said electromechanical transducer for providing an input signal to said electromechanical transducer having an audio frequency which is varied linearly from about 10^2 to 10^4 Hz with a repetition rate which is variable from about 2 Hz to about 50 Hz.

4,122,725

LENGTH MODE PIEZOELECTRIC ULTRASONIC TRANSDUCER FOR INSPECTION OF SOLID OBJECTS

Robert B. Thompson, Thousand Oaks, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 16, 1976, Ser. No. 696,679
Int. Cl.[2] H01L 41/10
U.S. Cl. 73—632 1 Claim



1. A transducer for producing an ultrasonic inspection signal and for receiving an echo of such signal in a solid object having low acoustic impedance, comprising:

an array of individual piezoelectric transducer elements each having a first length dimension and two end faces extending transversely to the length dimension, one end face of each element being positioned in a common surface, said end faces each having linear dimensions which are small in relation to said first dimension of the respective element so that each element has a dominating mode in the direction of the length dimension, said elements being spaced apart and positioned parallel to each other to form said array;

a thin, flexible sheet bound to said one end face of each of said transducer elements in said common surface for providing mechanical interconnection of said transducer elements within coupling them together for any transmission of oscillatory energy from one of the elements to any of the other ones, said sheet providing a transducer aperature for placing directly against the solid object; and

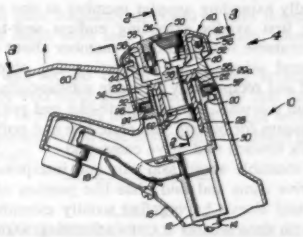
means for mechanically damping each of said transducer elements, said mechanical damping means being positioned between said transducer elements but not across said transducer aperature, whereby a low frequency signal can be launched deeply into a solid object having low acoustic impedance and ringing of the transducer dampened so that a returning signal can be detected.

4,122,726

LEVER MECHANISM FOR A MIXING VALVE

Julius L. Tolnai, Los Angeles, Calif., assignor to Price-Pfister Brass Mfg. Co., Pacoima, Calif.

Filed May 7, 1974, Ser. No. 467,712
Int. Cl.[2] F16H 21/02
U.S. Cl. 74—21 21 Claims



1. In a lever mechanism for use with a mixing valve of the type wherein axial position controls flow volume and angular position controls mixture:

(a) said valve having a body mounted in a fixture and a control valve stem guided by the body for angular movement about the stem axis and for rectilinear movement along the axis, the stem having an upwardly extending accessible end;

(b) a generally cylindrical fulcrum bracket forming an upper end element of said fixture and surrounding the extending end of said control valve stem, said fulcrum bracket having a radially outwardly opening fulcrum member receiving groove extending around at least a portion of the outer periphery thereof concentrically with said stem axis;

(c) an operating lever including a cowl freely overlying said fulcrum bracket and having attached to the inside thereof to be shielded by said cowl, a fulcrum member which projects into said fulcrum member receiving groove with radial clearance; the upwardly extending end of said control valve stem being pivotally connected to the center of said cowl at a transverse axis perpendicular to said stem axis;

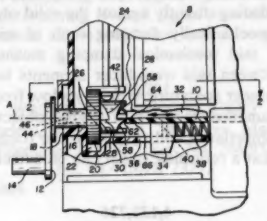
(d) tilting of said cowl about said fulcrum member causing axial movement of said valve stem to control flow volume, limited radial movement of said fulcrum member within said groove during said tilting permitting axial movement of said stem without binding, the angular extent of said groove being sufficient to permit angular motion of said cowl with concomitant mixture controlling angular movement of said stem;

(e) said lever having a handle part opposite said fulcrum member whereby said cowl serves as a working element in the transmission of lifting force to said stem.

4,122,727
TOY SIDEWALK MECHANISM

Edward C. Teter, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 1, 1977, Ser. No. 764,735
Int. Cl.[2] F16H *25/12, 25/16;* A63H *33/00*
U.S. Cl. 74—56 2 Claims



1. A toy sidewalk mechanism for imparting reciprocal movement to the sidewalk for advancing toy objects placed thereon in steps, comprising:

a drive member rotatable about an axis in clockwise and counter-clockwise directions, said drive member having an axially extending annular member at one end thereof having first axially extending endless saw-tooth drive cams rotatable with said drive member about said axis;

a horizontal sidewalk for supporting toy objects placed thereof and reciprocally movable substantially along said axis, said sidewalk having a plate-like end portion;

resilient means for biasing said plate-like end portion of said sidewalk toward said drive cams; and

a sleeve rotatable about said axis and interposed between said drive cams and said plate-like portion of said sidewalk, said sleeve having first axially extending endless saw-tooth driven cams at one end mating with said drive cams and second axially extending endless saw-tooth driven cams at the opposite end engaging said plate-like end portion, said drive, first and second saw-tooth cams each have an inclined rise surface for moving said sidewalk and objects together in a forward direction for transporting the objects finite distances to advance positions, and a fall surface for allowing said sidewalk to be rapidly returned by said resilient means in a reverse direction while the objects due to inertia remain substantially at said advance positions whereby rotation of said drive member in one of said clockwise and counter-clockwise directions causes said drive cams to rotatably drive said first driven cams and said sleeve in said one direction causing said second driven cams to reciprocally move said sidewalk causing the objects to advance in steps on said sidewalk, and rotation of said drive member in the other of said clockwise and counter-clockwise directions causes said fall surfaces of said second driven cams to engage opposite faces of said plate-like end portion of said sidewalk preventing rotation of said sleeve, and said drive cams to cam said first driven cams and said sleeve axially outwardly for reciprocally moving said sleeve and said sidewalk for also causing the objects to advance in steps on said sidewalk.

4,122,728
CONTROL LEVER ASSEMBLY

Charles E. Pilarczyk, Bedford Heights, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

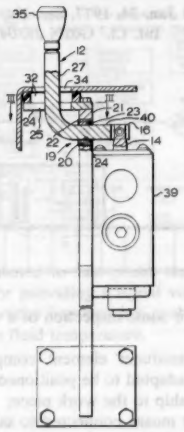
Filed Apr. 7, 1977, Ser. No. 785,619
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—103 9 Claims

1. A control lever assembly for effecting linear translation of an actuator of a machine comprising:

a control lever having one end adapted for pivoted connection to said actuator;

a first bracket plate adapted for fixture to said machine;

bearing means fixed in said first bracket for mounting said control lever and allowing rotation and translation of said control lever relative said bracket; and

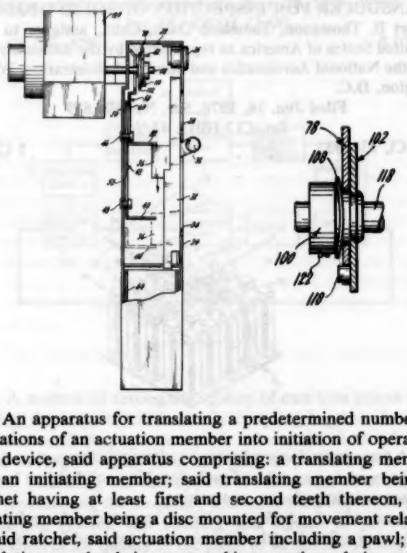


second bracket means fixed to, and extending generally at right angles to said first bracket plate, said second bracket means for limiting said rotative motion of said control lever to rotation about an axis generally lying in the plane of the first bracket and at right angles to the linear motion of said actuator.

4,122,729
OPERATION INITIATOR

Stanley Mitchel, 189 Farview Ave., Paramus, N.J. 07652

Filed Jan. 4, 1977, Ser. No. 756,913
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—128 7 Claims



1. An apparatus for translating a predetermined number of operations of an actuation member into initiation of operation of a device, said apparatus comprising: a translating member and an initiating member; said translating member being a ratchet having at least first and second teeth thereon, said initiating member being a disc mounted for movement relative to said ratchet, said actuation member including a pawl; said translating member being mounted in operative relation to said actuation member and including means being constructed and arranged for movement of said translating member a predetermined amount in a given direction as a result of operation of said actuation member; means mounting said initiating member

in operative relation to said translating member; coupling means for causing movement of said initiating member upon movement of said translating member in said given direction an amount greater than said predetermined amount; commencement means in operative relation to said initiating member and in operative relation to said device for initiating operation of said device upon said movement of said initiating member; said actuation member, said ratchet and said disc being constructed and arranged relative to one another and relative to said pawl, so that upon operation thereof from a first to a second position, said pawl engages one of said teeth on said ratchet and moves said ratchet in said given direction said predetermined amount, said disc including means being constructed and arranged so that said disc does not contact said pawl upon movement thereof to engage said teeth.

4,122,730

HOUSING FOR A MECHANICAL GEAR ARRANGEMENT

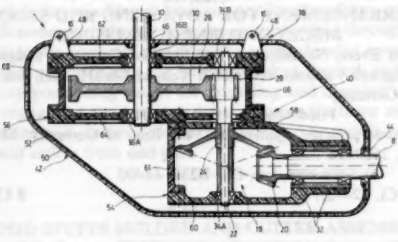
Emil Weiland, Hohenbrunn, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Mar. 22, 1977, Ser. No. 780,017

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612937

Int. Cl.² F16H *57/02*

U.S. Cl. 74—606 R **9 Claims**



1. A housing particularly for an arrangement of sets of meshing toothed gears defining gear steps for transmitting a drive force between a drive shaft and a driven shaft, said housing comprising, a high-strength supporting framework structure carrying bearings journaling respective shafts for each of the gears of said gear steps, said framework structure arranged for absorbing and corresponding to reaction forces acting between said bearings, and a non-metallic protective skin unstressed by said reaction forces enclosing said arrangement of meshing gears and said supporting framework structure, said supporting framework structure comprising a plurality of individual bending-resistant girder members, each girder member extending in beam-like fashion between two bearings of a pair of gears journaling said shafts of said gear sets for absorbing said reaction forces acting between said bearings, said bending-resistant girder members having reinforcing chords made of material which is highly rigid along the longitudinal direction of said chords.

4,122,731

MULTISPEED GEAR TRANSMISSION WITH PLURAL INPUTS TO INTERNAL GEAR

Harry Bendure, Coffeyville, and Larry L. Traxson, Cherryvale, both of Kans., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Mar. 18, 1977, Ser. No. 779,210

Int. Cl.² F16H *37/06*

U.S. Cl. 74—674 **9 Claims**

1. A constant mesh gear transmission comprising:

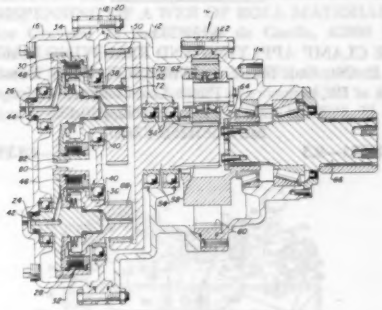
a housing;

an input shaft having an input gear mounted thereon;

a first clutch rotatably disposed in said housing including a first clutch gear and a first clutch output pinion;

a second clutch rotatably disposed in said housing including a second clutch gear and a second clutch output pinion;

said first and second clutches being operable to be selectively engaged and disengaged for driving their respective output pinions;



an internal gear rotatably disposed in said housing and in constant mesh with said first and second clutch output pinions;

said first and second clutch gears being arranged to be driven by said input gear in such a way that said internal gear may be rotatably driven by said first or second clutch output pinions when said first or second clutch is engaged, respectively.

4,122,732

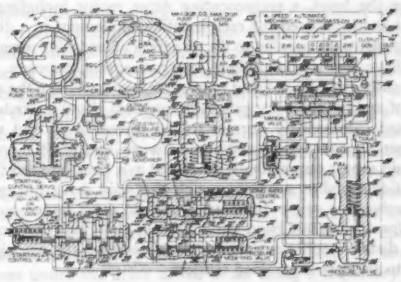
HYDROMECHANICAL MECHANICAL CONTINUOUSLY VARIABLE TRANSMISSION

Howard E. Chana, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 17, 1977, Ser. No. 759,826

Int. Cl.² B60K *41/04*

U.S. Cl. 74—863 **19 Claims**



1. In a transmission: an input element; an output element; continuously variable hydromechanical transmission means having planetary gearing means with an input member driven by said input element, an output member driving said output element and a reaction member for providing a mechanical torque path, and hydrostatic transmission means having ratio control means, including variable displacement means, providing a hydraulic torque path connected in parallel to said mechanical torque path between said reaction member and said output element and control means connected to said ratio control means for varying the hydrostatic transmission torque ratio, for providing a hydromechanical speed ratio range from zero speed ratio with all power transmitted in said hydraulic torque path and zero power in said mechanical torque path increasing to a transition speed ratio with a high portion of

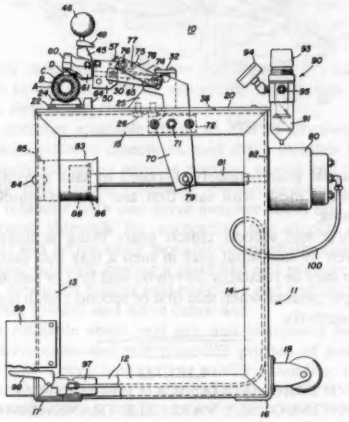
power transmitted in said mechanical torque path and a low portion of power transmitted in said hydraulic torque path and then to a mid-speed ratio with zero power in said hydraulic torque path and all power transmitted in said mechanical torque path and then limited to the highest used speed ratio with a high portion of power transmitted in said mechanical torque path and a low portion of power transmitted in said hydraulic torque path.

4,122,733

HOSE CLAMP APPLYING AND REMOVING MACHINE

John E. Ott, Oak Brook, and Marvin O. Bates, Bensenville, both of Ill., assignors to Punch-Lok Company, Chicago, Ill.

Filed Aug. 1, 1977, Ser. No. 820,433
Int. Cl.[2] B25B *27/10*
U.S. Cl. 81—9.3 **13 Claims**



1. A hose clamp applying machine for producing a predetermined tension in the metal band of a hose clamp, said machine comprising a slide member, band-pulling means mounted for sliding reciprocation on said slide member and adapted to engage the band, a reciprocating drive motor including an output shaft disposed for reciprocating movement in a direction substantially parallel to the direction of said slide member, and drive linkage providing interconnection between said band-pulling means and said output shaft intermediate the ends thereof and mounted for pivotal movement about a fixed axis disposed substantially normal to the direction of said slide member approximately midway between said slide member and said motor output shaft, said fixed axis being spaced from said slide member a distance such that said drive linkage is responsive to a single drive stroke of said drive motor output shaft for driving said band-pulling means along said slide member a distance sufficient completely to tension the associated band to said predetermined tension.

4,122,734

LABEL STRIPPING MACHINE

Richard F. Hurst, Childrens Farm/King Rd., Malvern, Pa. 19355

Filed Sep. 21, 1976, Ser. No. 725,252
Int. Cl.[2] B23B *3/00*
U.S. Cl. 82—1 C **9 Claims**

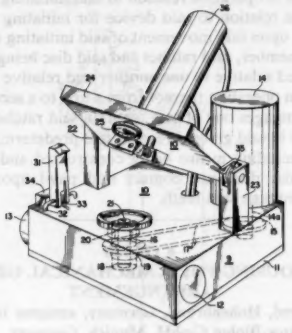
9. The method of removing a label from the outside of an irregular shaped cylindrical container comprising the steps of

centering said irregular shaped container on a rotatable platform,

applying an axial pressure on one end of said container to frictionally engage said container with said rotatable platform,

rotating said rotatable platform,

simultaneously axially moving a resiliently mounted cutting blade along the outside of said irregular cylindrical shaped container, and



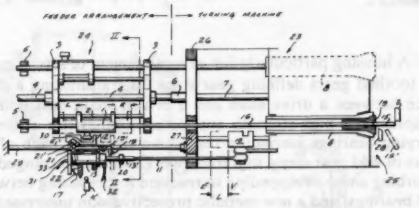
urging said resiliently mounted cutting blade into engagement with the outside of irregular shaped container to spirally remove said label attached thereon.

4,122,735

ARRANGEMENT FOR ADVANCING ROD STOCK PIECES IN TURNING MACHINES

Alfred Evers, Neumünster, Fed. Rep. of Germany, assignor to Hagenuk Vormals Neufeldt & Kuhnke GmbH, Kiel, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 775,362
Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609416
Int. Cl.[2] B23B *13/00*
U.S. Cl. 82—2.7 **9 Claims**



1. An arrangement for advancing rod stock pieces in a turning machine of the type having a drive and a work station at which successive workpiece portions of the rod stock pieces are to be treated, comprising means for successively feeding a rod stock piece to the work station, including a slide member for supporting a rod stock piece and being mounted on the machine for movement towards and away from the work station; means for coupling said slide member with the drive to thereby move said slide member together with the rod stock piece supported therewith through a stroke of predetermined length, including a slide carriage mounted on the machine for movement towards and away from the work station, means on said slide carriage and on said slide member for interconnecting said slide carriage and said slide member to thereby permit concomitant movement on said slide carriage and said slide member, and a control unit having a piston component and a cylinder component, one of said components being connected with said slide carriage and the other of said components being connected with the drive; and means for adjusting the length of the stroke of said slide member in dependence upon the length of the rod stock piece at the work station, including means for displacing one of said components relative to the other of said

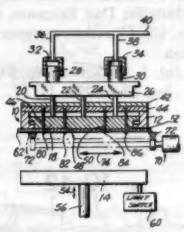
components to thereby move said slide carriage together with said slide member through a stroke of length greater than said predetermined stroke length.

4,122,736

APPARATUS AND METHOD FOR PERFORATING AN ARTICLE

Robert S. Price, Bicknell, and Norman L. Eisman, Vincennes, both of Ind., assignors to Universal Scientific Company, Vincennes, Ind.

Filed Nov. 14, 1977, Ser. No. 851,213
Int. Cl.[2] B26D *7/00, 7/08*
U.S. Cl. 83—23 **16 Claims**



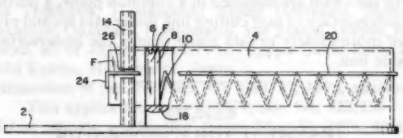
1. Punch apparatus comprising die punch means to penetrate an article for punching at least one portion therefrom, said die punch means including at least one part extending through said article in the course of punching the same, cleaning means for cleaning said part with the latter extending through said article, and positioning means for extending said cleaning means into engagement with said part for cleaning the latter and for retracting said cleaning means from said part to permit detaching said article from said part.

4,122,737

FOOD STUFFS HOLDER AND CUTTER ASSEMBLY

Richard E. Denson, 704 Perry St., Scottsborough, Ala. 35768

Filed Jun. 17, 1977, Ser. No. 807,446
Int. Cl.[2] B26D *7/16*
U.S. Cl. 83—268 **5 Claims**



1. A holder and cutter assembly for food stuffs in stick form, said assembly comprising a chamber for receiving a food stuff in stick form, a carrier disposed in said chamber and adapted to move lengthwise of said chamber in abutting relationship with said food stuff, means for biasing said carrier toward an opening in said chamber, stop means disposed outside said chamber proximate to said opening and in alignment with said chamber, said stop means being adapted to permit a portion of said food stuff stick to be exposed outside said chamber in response to said biasing means, and cutter means disposed adjacent to said opening and operable to cuttingly engage said exposed portion of said food stuff stick to sever said exposed portion from the remainder of said food stuff stick, said stop means being adapted to release said severed portion and move to a position removed from said severed portion, and wherein:

said assembly includes bracket means disposed adjacent to said opening, said bracket means slidably retaining said cutter means;

said stop means comprises wire spring means mounted on said housing, and said bracket means includes means for receiving said wire spring means and facilitating movement of said wire spring means in said slot means; and

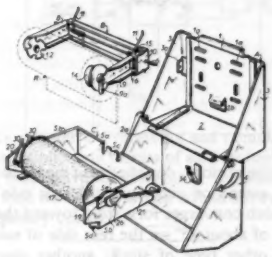
said cutter means has cam surfaces in engagement with said wire spring means to cause said wire spring means to move widthwise of said opening and outwardly therefrom in said slot means to disengage from said food stuff stick.

4,122,738

APPARATUS FOR THE CUTTING AND SIMULTANEOUS DISPENSING OF A WEB OF ROLL MATERIAL

Maurice Granger, 28 rue Charles de Gaulle, 42000 Saint-Etienne-Loire, France

Division of Ser. No. 671,818, Mar. 30, 1976, abandoned. This application Jul. 12, 1977, Ser. No. 814,931
Claims priority, application France, Nov. 19, 1975, 75 36254
Int. Cl.[2] B26D *1/56*
U.S. Cl. 83—314 **23 Claims**



1. An apparatus for successively cutting and simultaneously distributing sections from a web of roll material, the apparatus having a casing, a carrier for a roll of material mounted in the casing, a rotatable drum in said casing, said carrier being urged towards said drum such that the roll of material is frictionally engaged with the drum to cause the drum to be driven in rotation by manual traction applied to a free end of the material extending from the casing, said drum having opposite ends, a profiled pawl supported at one of the ends of the drum, elastic means positioned to engage said pawl for braking the rotation of said drum and halting the drum after one revolution thereof, an eccentric lever mounted at the other end of said drum for rotation therewith, energy storage means engaging said lever for resisting rotation of the drum during an initial period of rotation thereof while storing energy and then driving the drum in rotation by the stored energy, and cutting means for cutting the material on said drum, an improvement wherein said drum is hollow, said cutting means comprising a cutting member pivotably mounted in said drum for movement between operative and inoperative positions, cam means for pivotably moving the cutting member to its operative position by the drive of the drum, said drum having a slot therein, said cutting member being retracted in said drum in said inoperative position and projecting from said slot in said operative position, said cutting member being displaced by said cam means under the drive of the drum along a trajectory in the same direction of rotation of the drum to reach said operative position and cut the material to free a section thereof for release under the manual traction in the course of rotation of the drum.

4,122,739

MITERING DEVICE FOR WOOD AND METAL PICTURE FRAMES

Glenn Marlow, 3523 Robin Dr., Louisville, Ky. 40216

Filed May 19, 1977, Ser. No. 798,444
Int. Cl.[2] B27B *27/06*
U.S. Cl. 83—421 **23 Claims**

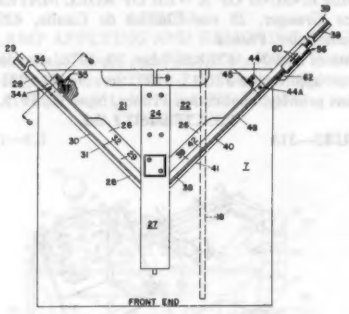
14. In the art of making mitered frame members on a work table associated with an operatively mounted mitering saw, an

improved device for use in mitering metal type stock and wood type stock, comprising:

A, a portable panel having a flat top work face, a front end, a rear end and a forwardly-rearwardly extending slot between such ends to receive said mitering saw,

1. said panel being removably mountable on said work table for guided back and forth sliding movement; and

B. abutment means including,



1. for one type of stock, one abutment means mounted on the panel to extend on and along the rear side of a vertical plane which converges forwardly toward the panel slot at an angle of about 45° on the rear side of said plane, and,

2. for the other type of stock, another abutment means mounted on the panel to extend on and along the front side of a parallel vertical plane, which converges forwardly toward the panel slot at an angle of about 135° on the front side of said parallel plane.

4,122,740

SHEAR

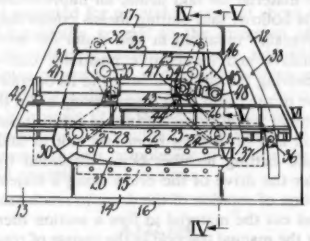
Jack Maltby, Sheffield, England, assignor to Davy-Loewy Limited, Sheffield, England

Filed Oct. 17, 1977, Ser. No. 842,819

Claims priority, application United Kingdom, Oct. 18, 1976, 43112/76; Nov. 15, 1976, 47453/76; Jun. 23, 1977, 26370/77; Jul. 1, 1977, 27614/77

Int. Cl.² B26D *5/18*

U.S. Cl. 83—646 **11 Claims**



1. A rolling cut shear having

(a) a frame;

(b) a stationary blade carried by said frame;

(c) a movable blade to cooperate with said stationary blade; and

(d) supporting and driving means for said movable blade, said means comprising:

(e) a pair of opposed toggle mechanisms which are pivoted to said movable blade at locations spaced along the length of said movable blade, and are pivoted to said frame about axes substantially perpendicular to the length of said stationary blade;

(f) coupling means between said toggle mechanisms causing said mechanisms to swing together;

(g) hydraulic drive means operatively coupled to said toggle mechanisms for driving said mechanisms about said pivot axes; and

(h) means for guiding said movable blade,

(i) the swinging of said toggle mechanisms resulting in said movable blade executing a rolling motion relative to said stationary blade.

4,122,741

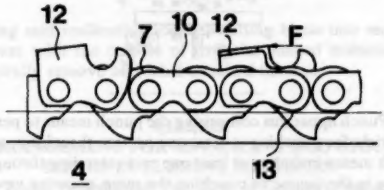
POWER SAW CHAIN

Thomas Engman, Mullsjöé; Dan Ericsson, and Goran Landen, both of Huskvarna, all of Sweden, assignors to Husqvarna AB, Huskvarna, Sweden

Filed Jul. 7, 1977, Ser. No. 813,688

Int. Cl.² B27B *33/14*

U.S. Cl. 83—834 **3 Claims**



1. A power saw chain comprising interconnected driving links, side links and cutting links, each cutting link having an upper surface defining a cutting edge, a lower surface, a first pivot forwardly of said cutting edge in the direction of propulsion of the saw and a second pivot rearwardly of said cutting edge, said pivots attaching said cutting link to successive driving links respectively, each side link having an upper surface, a lower surface and forward and rearward pivots attaching said link to successive driving links respectively and wherein when the first and second pivots of a cutting link and the forward and rearward pivots of a side link adjacent said cutting link lengthwise of the chain are disposed in a common plane, a portion of said undersurface of said cutting link under said second pivot is spaced more closely to said plane than is the undersurface of said side link.

4,122,742

TRANSIENT VOICE GENERATOR

Ralph Deutsch, Sherman Oaks, Calif., assignor to Deutsch Research Laboratories, Ltd., Sherman Oaks, Calif.

Filed Aug. 3, 1976, Ser. No. 711,397

Int. Cl.² G10H *3/00*

U.S. Cl. 84—1.11 **9 Claims**

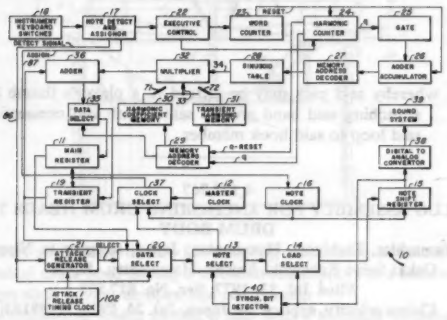
1. In a musical instrument of the type including a keyboard having a plurality of key-operated switches, a plurality of tone setting stop switches, generation means for synthesizing a musical waveshape by calculating its constituent generalized Fourier components and wherein each Fourier component is established by a harmonic coefficient associated with the corresponding Fourier component, said generation means including first circuitry operative during a computation cycle for individually calculating the constituent Fourier components and an accumulator for summing these Fourier components to form a master data set in which the relative values of the words are established by a set of harmonic coefficients selected in response to the setting of said stop switches and second circuitry having a plurality of registers for receiving transferred master data set words, and a convertor means for generating analog output musical waveshapes from data read out of regis-

ters by associated clock generators; the improvement for time variant modification of the synthesized musical waveshapes comprising;

means for computing a master data set and a transient data set during a computation cycle,

a first storage means comprising a first memory means for writing said master data set to be thereafter read out and a second memory means for writing said transient data set to be thereafter read out,

a third memory means for writing input data to be thereafter read out,



means for repetitiously reading out data stored in said first storage means at selected rates,

a transient signal control generator wherein a select signal is created in response to actuation of said key-oriented switches, and

select means responsive to said select signal whereby data is selectively read out from said first memory means or is selectively read out from said second memory means and the selected data is transferred and caused to be written into said third memory means thereby producing said time variant modification of the synthesized musical waveshape.

4,122,743

ELECTRONIC MUSICAL INSTRUMENT WITH GLIDE

Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, Hamamatsu, and Toshio Takeda, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 581,180, May 27, 1975, abandoned. This application Aug. 9, 1977, Ser. No. 823,236

Claims priority, application Japan, May 31, 1974, 49-61712; May 31, 1974, 49-61713

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **8 Claims**

1. An electronic musical instrument comprising:

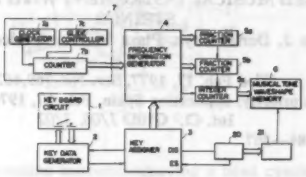
means for generating a key address code corresponding to a depressed key;

a frequency information memory for storing basic frequency information corresponding to notes of respective keys and producing, upon receipt of said key address code, frequency information corresponding to said key address code;

a glide code generator comprising a clock pulse generator, a counter for counting the clock pulses generated and producing a glide code output which progressively changes in value with the pulse count, and a glide controller for controlling the counting operation of said counter to perform counting during only a predetermined period of time;

a glide information generator coupled to said glide code generator and responsive to the glide code output thereof for producing a glide information output which initially represents a value other than 1 and thereafter changes in equal increments in time step with said glide code output until it represents a value equal to 1;

a multiplier coupled to said glide information generator and said frequency information memory for multiplying said glide information output with the basic frequency information produced by said frequency information memory;



a frequency counter for receiving and cumulatively counting the multiplication results of said multiplier; and

a musical tone waveshape memory for storing a desired musical tone waveshape which is read out by the output of said frequency counter.

4,122,744

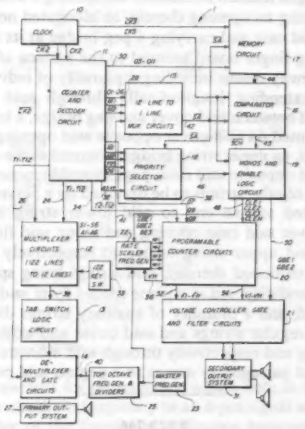
VARIABLE FREQUENCY GENERATOR FOR POLYPHONIC ELECTRONIC MUSIC SYSTEM

Dale M. Uetrecht, Colerain Township, Hamilton County, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 15, 1977, Ser. No. 824,562

Int. Cl.[2] G10H *1/04, 5/00*

U.S. Cl. 84—1.25 **5 Claims**



1. A frequency generator for keyboard electronic musical instruments for generating multiple master tone signals that may be dynamically shifted in frequency with respect to one another comprising:

master frequency clock generator means for producing master clock frequency signals;

vibrato signal means for providing first signals that vary in frequency at a rate depending on the number of keys played;

ensemble signal means for providing second signals the frequency of which varies depending on the time elapsed

since a first key was played, the number of keys played, and the highest note of the keys played;

frequency shifting means for receiving the master clock frequency signals, the first signals and the second signals and producing a plurality of output tone signals which are varied in frequency with respect to the master clock frequency signals and to one another in response to variation of the first and second signals.

4,122,745

STRINGED MUSICAL INSTRUMENT WITH AUXILIARY STRINGS

Francisco J. Darias Paya, Plaza Mayor, 4, Alcoy (Alicante), Spain

Filed Feb. 17, 1977, Ser. No. 769,462
Claims priority, application Spain, Feb. 17, 1976, 218.881
Int. Cl.[2] G10D *1/08, 3/02*
U.S. Cl. 84—267 **5 Claims**

1. A stringed musical instrument comprising a case including a cover having an opening therein, an elongated neck extending from said case and carrying a peg bridge at its free end, a fret carrying finger board secured to the surface of said neck and passageway means including a plurality of individual passageways extending longitudinally through said neck and finger board between said cover and peg bridge, a lower string bridge mounted on said cover opposite said opening from said finger board, an upper string bridge mounted at the end of said finger board opposite said case, pegs rotatable mounted in said peg bridge, regular strings to be operated by a player individually anchored at one end to said lower string bridge and stretched over said case opening and along said finger board and over said upper string bridge to respectively individual pegs to be tensioned thereby, said strings being spaced from each other and disposed in a plane spaced from said cover and finger board, and a plurality of auxiliary strings disposed between said regular strings and said cover and extending over said opening and respectively through said individual passageways of said passageway means to a peg on said peg bridge.

4,122,746

STRINGED MUSICAL INSTRUMENT PICK

Quilla H. Freeman, 1050 N. Gardner St., Los Angeles, Calif. 90046

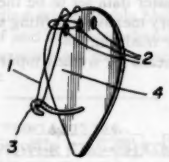
Filed Jan. 17, 1977, Ser. No. 760,190
Int. Cl.[2] G10D *3/16*
U.S. Cl. 84—322 **4 Claims**

1. A thumb pick for picking the strings of a stringed musical instrument, comprising:

a flat, generally triangular body having an apex used for picking said strings and a relatively broad edge opposite said apex;

a flexible band attached to said body proximate said broad edge, said band having a loop formed at the end remote from said body;

a hook member connected to said body in the vicinity of said apex, said hook member extending outwardly from said body;



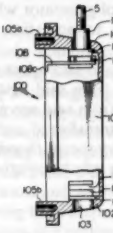
whereby said pick may be affixed to a player's thumb by stretching said band around said thumb and connecting said loop to said hook member.

4,122,747

LUG ASSEMBLY FOR ANCHORING DRUM HEADS TO DRUM BODY

Yamashita, Toshinori, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 22, 1977, Ser. No. 817,971
Claims priority, application Japan, Jul. 24, 1976, 51/99143[U]
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—411 R **11 Claims**



1. An improved lug assembly for drums comprising, in combination,

a hollow casing having an opening on the side thereof, a side wall spaced apart from said opening and at least one operational end wall connected to said side wall, said operational end wall being provided with a through-hole,

an inner extension formed within said casing at a position adjacent to said through-hole and having a member facing said opening, said extension being further provided with an outer groove opening to said through-hole, an intermediate groove extending adjacent to and in communication with said outer groove, an inner groove extending adjacent to and in communication with said intermediate groove, and a pair of shelves extending adjacent to said inner groove to partly define the innermost border of said inner groove,

a bushing having an end flange received in said intermediate groove and a cylindrical portion extending outwardly of said casing through said through-hole,

a non-metallic elastic insert inserted over said cylindrical portion of said bushing and compressively received in said outer groove,

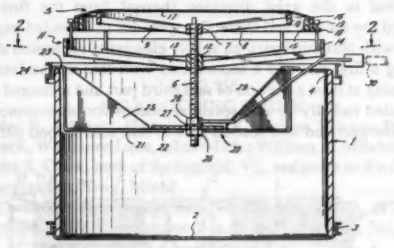
a seat received in said inner groove and extending towards said opening of said casing, and

a lug bolt in screw engagement at one end thereof with said cylindrical portion of said bushing and adapted at the other end thereof for anchoring the drum head to the body of the drum.

4,122,748
ADJUSTABLE PITCH DRUM

Randall L. May, 7726 Dawnridge, Houston, Tex. 77071

Continuation-in-part of Ser. No. 731,361, Oct. 12, 1976, Pat. No. 4,048,895. This application Sep. 8, 1977, Ser. No. 831,671
The portion of the term of this patent subsequent to Sep. 20, 1994, has been disclaimed.
Int. Cl.[2] G10D *13/02*
U.S. Cl. 84—411 A 9 Claims



1. A supporting device for coupling a rotatable adjustable musical drum head having a threaded rod support to a hollow drum shell having an open end comprising:

a supporting spider having a hub with a threaded opening adapted to be positioned substantially axial of said drum shell when assembled.

said spider having a plurality of outwardly extending supporting legs having rebent outer end portions adapted to fit over the open end of said drum shell, and adapted to be held in position by a head hoop,

a threaded supporting rod having one end threaded adjustably in said threaded hub opening,

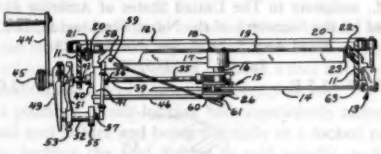
a locking nut threaded on said rod and adapted to lock said rod in any predetermined position, and

the other end of said rod being adapted to support said rotatable adjustable drum head.

4,122,749
MARCHING TIMPANI

John L. Hoellerich, Northbrook, Ill., assignor to Slingerland Drum Co., Niles, Ill.

Filed Mar. 2, 1977, Ser. No. 773,508
Int. Cl.[2] G10D *13/04*
U.S. Cl. 84—419 15 Claims



1. A marching timpani comprising:

an annular shell defining an open upper end, the height of said shell being a fraction of the diameter thereof;

a head secured across said upper end;

a horizontal support extending across said shell below said upper end;

pivot means mounted to said support coaxially of said shell;

a crank having a horizontal shaft and a handle at an outer end of the shaft accessible exteriorly adjacent said shell for manually rotating said shaft;

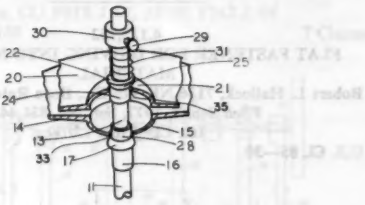
means for pivoting said pivot means as the result of rotation of said shaft; and

head adjusting means responsive to pivoting of said pivot means for adjustably tensioning said head.

4,122,750
HOLDING DEVICE FOR CYMBALS

Gary M. Rinker, 3121 E. 5th St., Anderson, Ind. 46012

Filed May 5, 1977, Ser. No. 794,035
Int. Cl.[2] G10D *13/02, 13/06*
U.S. Cl. 84—421 12 Claims

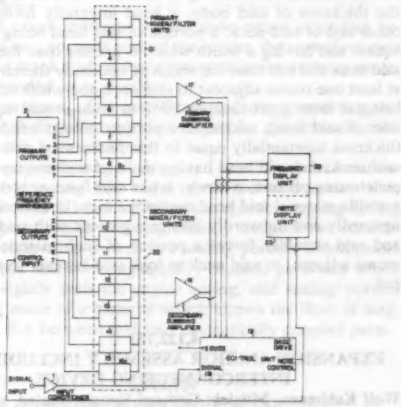


1. In a percussion instrument having a head cymbal and a lower cymbal mounted to a shaft through their openings for supporting said cymbals thereon, a holding device therefor comprising a first member secured to the shaft for supporting said lower cymbal thereon, a second member slidably engaged on said shaft and positioned above and in engagement with said head cymbal, and means connected to the shaft for urging said second member downwardly against said head cymbal to thereby yieldably hold the cymbals in contact with one another.

4,122,751
AUTOMATIC INSTRUMENT TUNER

Noel M. Calvin, 2683 Buena Vista Way, Berkeley, Calif. 94708

Filed Apr. 8, 1977, Ser. No. 786,008
Int. Cl.[2] G10G *7/02*
U.S. Cl. 84—454 15 Claims



1. An apparatus for determining which note in the musical spectrum is closest in frequency to an input signal and generating a display of the frequency difference between the input signal and that note, comprising in combination:

frequency generator means for simultaneously producing a plurality of signals corresponding to the same note in a plurality of octaves, said frequency generator means being programmable such that any of the twelve notes in the scale may be produced;

mixer filter means consisting of a plurality of mixer-filter units each of which mixes said input signal with one of the outputs of said frequency generator means and produces an output if the input signal is within ½ semitone of the frequency of said output of the frequency generator:

control means which monitors all of the mixer-filter units

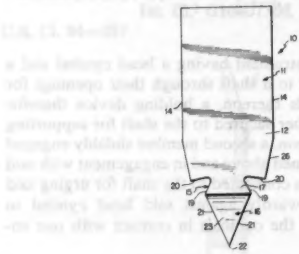
and programs the frequency generator to provide a different note if none of the mixer-filter units is producing an output, trying all twelve notes in sequence until one or more of the mixer filter units produces an output, at which time said control means activates a display means providing a display of the frequency difference between the input signal and said frequency generator.

4,122,752

FLAT FASTENER FOR DRIVING INTO METALLIC MATERIAL

Robert L. Hallock, 7136 NE. 8th Dr., Boca Raton, Fla. 33432

Filed Sep. 8, 1977, Ser. No. 831,443
Int. Cl.[2] F16B *15/00*
U.S. Cl. 85—30 **3 Claims**



1. A fastener for driving into metallic material comprising a body of predetermined width and thickness, said body being non-circular in cross-section and of a configuration to be formed by a press, a neck integrally formed at one end of said body and extending longitudinally outwardly therefrom, said one end of said body defining at least one shoulder adjacent to said neck, said neck having a thickness substantially equal to the thickness of said body, a head integrally formed at the other end of said neck, a portion of said head being generally square and having a width which is greater than the width of said neck and less than the width of said body thereby forming at least one recess adjacent to said neck, the width of said neck being at least approximately 85% as wide as said square portion of said head, said square portion of said head having a thickness substantially equal to the thickness of said body and said neck, and said head having inclined surfaces tapering to a penetrating portion, whereby when said fastener is driven into metallic material said head causes the metallic material to flow upwardly and outwardly into engagement with said shoulder and said shoulder forces a portion of such material into the recess adjacent to said neck to lock said fastener to said material.

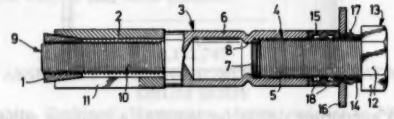
4,122,753

EXPANSION ANCHOR ASSEMBLY INCLUDING AN INTERCONNECTING DEVICE

Wolf Kuhlmann, Münich; Gerhard Rumpp, Inning, and Albert Busler, Altmuhldorf, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 13, 1976, Ser. No. 714,334
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1975, 2536136
Int. Cl.[2] F16B *13/06, 31/02*
U.S. Cl. 85—74 **40 Claims**

1. An expansion anchor assembly insertable into a borehole in a support structure for securing a member to the support structure, said anchor comprising an axially elongated first part having a first end and a second end with the second end arranged to be positioned exteriorily of the borehole and having a shoulder thereon at least adjacent the second end for use in securing the member to the support structure and the first end arranged to be positioned interiorly within the borehole, said first part being threaded for at least a portion of its axial length, an axially elongated second part having a first end and a second end with the first end projecting outwardly beyond the first end of said first part so that it is arranged to project further into the borehole and said second part being threaded in the axial direction adjacent the second end thereof and being in threaded engagement with said first part, a third part having a first end and a second end and the second end of said third part connected to the first end of said second part and projecting axially outwardly therefrom so that it is arranged to project therefrom further into the borehole, said third part being threaded in the axial direction thereof from the first end toward the second end thereof, a spreader in threaded engagement with said third part, an axially elongated expansion sleeve having a first end and a second end with said sleeve laterally enclosing at least a portion of said third part and arranged to be expanded radially by said spreader, means for interconnecting said first part and said second part so that said second part can



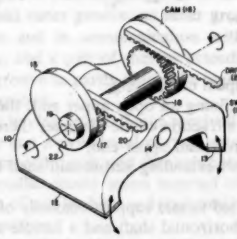
be rotated about its elongated axis by said first part and said means providing automatic disengagement of the interconnection between said first part and said second part when a minimum anchoring value is achieved as said third part connected to said second part pulls said spreader into said expansion sleeve and expands it radially outwardly into engagement with the borehole in the support structure, wherein the improvement comprises that said means interconnecting said first and second parts is located intermediate the second end of said expansion sleeve and the shoulder on said first part and said first part being rotatable about its elongated axis relative to said second part upon the automatic disengagement of said means so that said first part can be threaded into said second part for axial movement relative thereto permitting movement of said shoulder toward the second end of said second part, and when the member is secured to the support structure by said first part said means is completely enclosed and covered between the shoulder on said first part and said second part.

4,122,754

DEPENDENT SWAY BRACING WEAPON RESTRAINTS

Clayton E. Panlaqui, and Lloyd J. Holt, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 5, 1977, Ser. No. 822,125
Int. Cl.[2] F41F *5/02*
U.S. Cl. 89—1.5 B **7 Claims**



1. An automatic sway brace mechanism for an aircraft carrying a releaseable store comprising:

a mechanism including a pair of movable arms terminating in store engaging pads;

said arms being movable from a retracted to a store engaging position;

cam means in engagement with said arms and operative to drive said arms from the retracted to the store engaging position and back to the retracted position;

cam driving means for driving said cam means;

said sway brace mechanism being automatically self-centering and accommodating different store sizes without individual manual adjustment of the arms or pads.

4,122,755

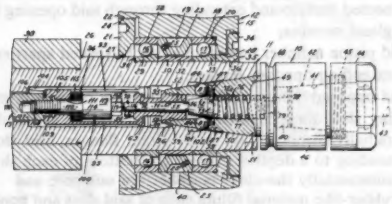
SELF-LOCKING CHUCK

Charles R. Johnson, Howell; John K. Forlow, Wixom; Paul G. Black, Whitmore Lake, all of Mich.; William A. Mitchell, and John S. Clark, both of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 739,390, Nov. 8, 1976, abandoned. This application Feb. 9, 1977, Ser. No. 767,176

Int. Cl.[2] **B23C** *5/26*

U.S. Cl. 90—11 A **6 Claims**



1. In a machine tool having a rotatable spindle with a bore formed therethrough, and wherein said spindle is provided with a tool holder seat comprising an inwardly coverging frusto-conical socket communicating with one end of said bore in said spindle, the combination comprising:

(a) a tool holder, said tool holder having a frustoconical shank and adapted to be operatively mounted in said spindle socket;

(b) a retention means carried by said tool holder;

(c) a tool holder gripping means operatively mounted in said spindle bore for releasable gripping engagement with said retention means for releasably retaining said tool holder in said spindle;

(d) a draw bar opertively mounted in said spindle bore for axial movement with repect to said spindle to operate said tool holder gripping means between a tool holder locked position and a tool holder unlocked position;

(e) a plurality of self-locking balls operatively mounted in said tool holder and being normally in a locked position for locking the tool holder in said spindle, and being adapted to be moved to an unlocked position by said draw bar when the draw bar is moved to a tool holder unlocked position;

(f) spring biased means for normally biasing each of said locking balls radially outward into locking engagement with the spindle;

(g) said spring biased means includes a plunger member engageable with each of said locking balls and a spring means for normally biasing said plunger member in a direction to move each of said locking balls radially outward into locking engagement with said spindle; and

(h) said spindle bore includes a frusto-conical inwardly converging seat for releasable locking engagement with said plurality of said locking balls.

4,122,756

VAPOR ENGINE

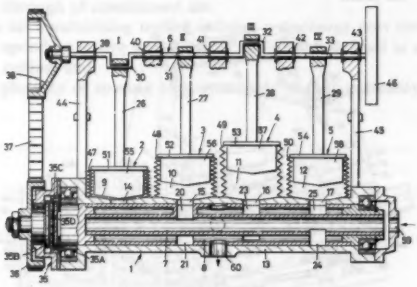
Edgard Grundmann, Fallersleben, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,453

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1976, 2603249

Int. Cl.[2] **F01B** *1/02, 19/00;* **F16J** *3/04*

U.S. Cl. 91—180 **7 Claims**



1. A vapor engine using a refrigerant as its working medium, said engine comprising:

(a) a plurality of bellows each forming an expansion chamber for receiving the working medium, each of said expansion chambers changing its volume under the influence of the pressure exerted by the vaporized working medium;

(b) a crank shaft arranged above and mechanically connected to each of said bellows;

(c) rotary slide means arranged below said bellows for controlling the flow of the working medium to and from said bellows;

(d) said crank shaft and rotary slide means extending between two opposite ends of the engine. the axes of rotation of said crank shaft and said rotary slide means being generally parallel to each other;

(e) means arranged at one of said ends for connecting said crank shaft and rotary slide means for synchronous rotation with each other; and

(f) said engine having a casing and said means for rotationally connecting said crank shaft and said rotary slide means to each other including a magnetic coupling having two parts which are magnetically coupled for rotation with each other as well as a sealing portion which passes between said two magnetically coupled parts and which fluid-tightly seals the engine casing, said sealing portion being made of a material which allows the flow of magnetic flux between said two magnetically coupled parts.

4,122,757

FLUID OPERATED ENGINE

David P. McConnell, P.O. Box 591, Minden, Nev. 89423, and Louis E. Tully, La Canada, Calif., assignors to David P. McConnell, Minden, Nev.

Filed Feb. 3, 1976, Ser. No. 654,763

Int. Cl.[2] **F01B** *13/04*

U.S. Cl. 91—506 **10 Claims**

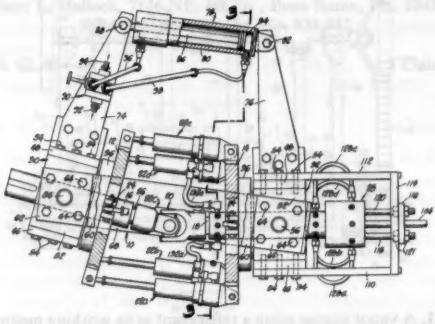
1. A fluid operable engine, comprising:

(a) a frame structure;

(b) a pair of confronting spaced apart disc-like plate members respectively mounted on said frame for rotation about a right-angled axis of rotation, said plate members being relatively oppositely inclined with respect to each other and relatively oriented on their axes to position points of maximum spacing on one side of their axes and points of minimum separation on an opposite side;

(c) a plurality of pressurized fluid actuated axially expansile and retractile devices extending between and being connected to corresponding circumferentially spaced points of said members;

(d) power delivery shaft means connecting said members for simultaneous rotation comprising separate shaft sections fixedly supporting said members and being independently supported for rotation at opposite ends of said frame structure, said shaft sections having adjacent ends disposed between said members interconnected by a universal joint;



(e) a bearing assembly containing radial and axial thrust bearing elements for supporting each of said shaft sections, each of the bearing assemblies being supported on the frame structure for swinging movements to change the angular relationship of said shaft sections and said members thereon with respect to each other; and

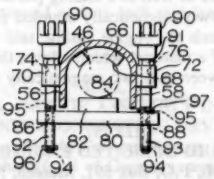
(f) valve means operable in synchronized timed relation to said rotation for sequentially controlling the actuating fluid for said devices so as to cause rotation of said members and the connected power delivery shaft.

4,122,758

SERVICE SUPPORT

Harold F. Bieringer, Peoria; Derrell G. Jones, Washington, and Gary S. Schwartzkopf, Aurora, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 9, 1977, Ser. No. 804,978
Int. Cl.² F15B *15/26*
U.S. Cl. 92—23 **15 Claims**



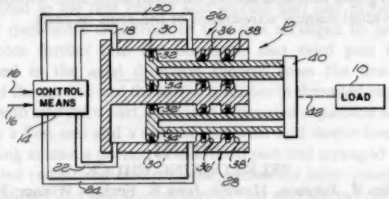
1. A service support in combination with a cylinder rod of a cylinder, said service support comprising an elongate U-shaped body portion having legs with bottom edges adapted to be placed over said cylinder rod, a pair of lugs carried by an intermediate portion of said body portion and extending outwardly an opposite sides thereof along axes extending perpendicular to a plane containing the bottom edges of said legs, a plate bridging the space between the legs of said U-shaped body portion and having threaded apertures aligned with said lugs, and a pair of threaded members passing through said lugs and being threaded into said apertures in said plate to secure said body portion to said cylinder rod.

4,122,759

JAM-PROOF ACTUATOR STRUCTURE

Manfred A. Runkel, Valencia, and Joseph Licha, Chatsworth, both of Calif., assignors to Textron Inc., Providence, R.I.

Filed Dec. 13, 1976, Ser. No. 750,110
Int. Cl.² F16J *9/06, 15/18;* F15B *11/16*
U.S. Cl. 92—168 **9 Claims**



1. An actuator having a jam-proof structure for allowing said actuator to continue movement subsequent to deformation of a portion thereof, said actuator comprising:

a cylinder including a metallic gland member defining an opening therethrough;

a metallic piston member slidably disposed within said cylinder and having a rod defining an outer periphery connected thereto and extending through said opening in said gland member;

said piston member including a pair of spaced apart radially extending opposed flanges;

said opposed flanges defining a plurality of radially extending slots therethrough thereby providing a plurality of radially disposed segments in said flanges, said slots extending to a depth such that the bottom of each slot is at substantially the outer periphery of said rod; and

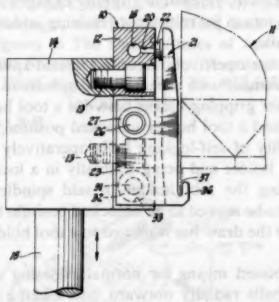
a rubber-like material filling each of said slots and bonded to said flanges to provide solid flanges of alternate metal and rubber-like material.

4,122,760

CARTON JAM DETECTION MEANS

Gregory J. Dwyer, Livonia, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 12, 1977, Ser. No. 731,174
Int. Cl.² B65B *57/02*
U.S. Cl. 93—36 R **4 Claims**



1. In a coated paperboard carton packaging machine having a carton loader apparatus, including a carton lift rod, the combination comprising:

(a) a valve block mounted on said lift rod and having pressurized air passages formed therethrough and having an inlet end adapted to be connected to a source of an air supply system, and having an outlet end forming a valve seat orifice;

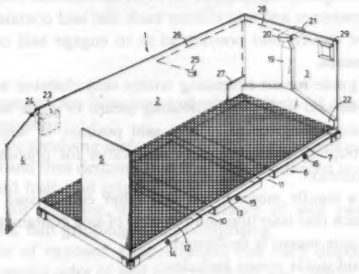
(b) a carton lifter finger movably mounted on said valve body;
(c) vent valve means carried on said lifter finger for normally enclosing said valve seat orifice when the lifter finger is in a releasable carton loading position; and,
(d) means for normally biasing said lifter finger into said releasable carton loading position to maintain said vent valve on said valve seat orifice, whereby when a carton jam appears during the loading of a carton on a mandrel, the resistance of the carton jam will pivot the lifter finger from said releasable carton loading position to a position whereby the vent valve means is moved off of the valve seat orifice and air is permitted to vent to the atmosphere through the valve seat orifice and provide a control signal.

4,122,761

DANGEROUS GOODS SHIPPING CONTAINER

Per-Olov Westin, Ektorp, and Per A. Marklund, Skelleftea, both of Sweden, assignors to AB Svenska Godscentraler, Stockholm and AB Plastkarosser, Skelleftea, both of, Sweden

Filed May 10, 1977, Ser. No. 795,597
Int. Cl.[2] F24F *13/00*; B65J *1/02*
U.S. Cl. 98—33 R **8 Claims**



1. A shipping container for transporting dangerous goods, such as poisonous or explosive liquids stored in cans, comprising:
(a) a roof member, a bottom member and four side wall members joined together to form a gas tight enclosure, one of said members comprising access means,
(b) said bottom member comprising a plurality of upwardly open, liquid-tight trays separated from each other by respective tray side walls,
(c) a plurality of fork lift tyne tunnels spaced from each other and defined between adjacent tray side walls,
(d) an apertured, load-bearing inner floor disposed above said trays and tunnels to define a continuous ventillation passage extending beneath the full area of said inner floor,
(e) forced air exhaust means mounted in said container in communication with said ventillation passage, and
(f) adjustable air intake means disposed in said container and spaced from said air exhaust means, whereby any spilled liquid flows through said apertured inner floor into the tray therebeneath, and said exhaust means draws air through said intake means via the interior of said container and said ventillation passage, to thereby purge any dangerous liquid vapors from said container.

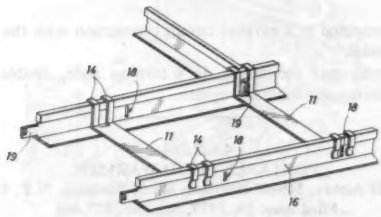
4,122,762

AIR-SLOT SPACER CLIP

Arthur C. Williams, 21711 Glenbranch, Spring, Tex. 77373

Filed Mar. 7, 1977, Ser. No. 775,387
Int. Cl.[2] G09F *7/18*; F24F *13/06*
U.S. Cl. 98—40 D **6 Claims**

1. An interconnected ceiling structure for a building having an air-slot therein for the introduction therethrough of conditioned air, comprising:
a plurality of spaced, inverted-tee support members, each having a flange portion and a vertical portion and supported in said building,
a plurality of ceiling tiles adapted for supporting placement between said inverted-tee support members for forming a building ceiling,
at leat one inverted-tee support member having a flange positioned adjacent to and spaced apart from a preselected one of said plurality of spaced apart inverted-tee support members supported in said building for defining an air-slot therebetween in said ceiling for the introduction therethrough of conditioned air,
an air conditioning troffer defining a discharge port corresponding in size and shape to said air-slot defined in said ceiling, and
a plurality of spacing clips attachable at each extremity to



the vertical portion of one of said preselected spaced inverted-tee support members for rigidly maintaining said spaced apart relation therebetween and for receiving and supporting said discharge port of said air conditioning troffer in fixed relation to said ceiling, each spacing clip comprising
a central body member, a pair of leg members depending from opposing ends of said body member,
each of said leg members defining a slot sized to receive an intersecting inverted-tee support member therein and being a generally inverted U-shape for engaging said vertical portion of an adjacent inverted-tee support member and positioning said body member in abutting engagement with said flanges of said tee support members, and
means located on said leg members for securely gripping said vertical portion of said inverted-tee support members.

4,122,763

HOUSEHOLD COFFEE MACHINE WITH CALCIFICATION INDICATOR

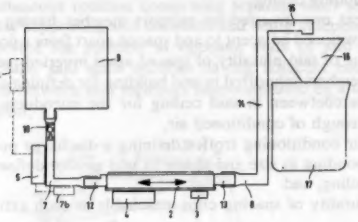
Rudolf Waninger, Villingen-Schwenningen, and Frank Obrowski, Bad Duerrheim, both of Fed. Rep. of Germany, assignors to Wigo Gottlob Widmann & Soehne GmbH & Co. KG, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 805,979
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646312
Int. Cl.[2] A47J *31/58*
U.S. Cl. 99—281 **9 Claims**

1. In a household coffee machine having a coffee making cycle and including
a flow heater with
a cold water supply conduit,
a hot water outlet,
a thermostat for controlling the temperature of the flow heater, and
a calcification indicator switch responsive to a predetermined condition for effecting operation of a calcification indicator system,
the improvement wherein
the calcification indicator system comprises
a glow lamp operable in circuit arrangement with a signal flasher circuit, and
means to actuate said switch at a time dependent on the

conclusion of the coffee making cycle for disabling the calcification indicating system, and

at least a portion of said calcification indicator system being



connected in a parallel circuit connection with the thermostat,

whereby said thermostat, in a turn-on state, disables the calcification indicator system.

4,122,764

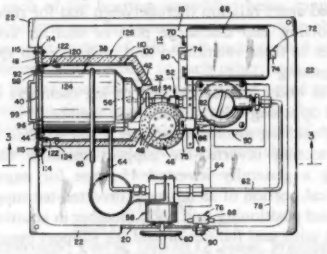
PORTABLE FOOD WARMER

Grace D'Ambra, 149-45 Northern Blvd., Flushing, N.Y. 11354

Filed Aug. 24, 1977, Ser. No. 827,364

Int. Cl.[2] F24C 5/20

U.S. Cl. 99—483 **9 Claims**



1. A portable apparatus for warming food products and powered by fuel from a fuel container having a valve at one end thereof and an annular rim at substantially the other end thereof which fuel is to be initially ignited by a battery power source, said portable food warmer comprising in combination:

A. housing means having a chamber therein,

B. said housing means including a bottom wall with housing walls extending upwardly from said bottom wall and forming said chamber,

C. a hot plate mounted across said housing means with said chamber closed by said hot plate,

D. means for retaining said battery in removable position in said housing means,

E. heater means mounted in said chamber, said heater means comprising:

(1) a burner extending in vertically spaced relationship below said hot plate for heating same,

(2) regulator means operatively connected to said burner to control the volume of fuel flowing to said burner from said container, and

(3) coupling means for releasably connecting said regulator means to said valve of said container for operatively opening said valve to permit a flow of fuel to said regulator means,

F. ignition means in said chamber mounted in operable relation to said burner and adapted to be coupled to said battery so as to ignite the fuel upon the commencement of usage of the portable apparatus when fuel is flowing through said regulator means, said ignition means including

(4) a filament adapted to receive an electric current to elevate same to a temperature sufficient to ignite the fuel, and

(5) switching means coupled to said battery and said filament such that when said switching means is in its energized position electric current flows through said filament to heat same,

G. mounting means operatively associated with one of said walls of said housing means and in alignment with said coupling means so as to removably support said container in operative relation to said coupling means so as to bring said valve into abutting engagement with said coupling means to open said valve and permit a flow of fuel from said container to exit into said coupling means for use in said heater means for maintaining a flame in said burner,

H. said mounting means comprises:

(6) a closure having oppositely disposed inner and outer ends,

(7) support means mounted on said inner end to provide releasable engagement between said annular rim of said container and said closure such that said container may be moved into position so as to engage said coupling means,

(8) guide means extending within said chamber adjacent one said wall of said housing means to guide said container longitudinally into said position in which said coupling means engages said valve for opening same thereto,

(9) a handle mounted on said outer end of said closure such that insertion and removal of said container in said guide means is facilitated,

(10) said guide means includes:

(a) a guide member having an axially extending bore therethrough,

(b) said guide member being mounted on one of said walls such that said container is adapted to be positioned in telescopic relationship with said guide member, and

(c) said guide member includes a radial flange on one end thereof for coupling to one of said walls, and said other end includes an inwardly tapered skirt for extending in conformable relation to the end of said container having said valve thereon, and

(11) said support means includes:

(a) an arm extending outwardly from said inner end of said closure,

(b) a finger disposed in vertically spaced relationship to said inner end of said closure and connected to said arm at one end thereof, and

(c) said finger being spaced from said inner end of said closure a distance so as to provide a seat for receiving said rim of said container therein such that a releasable assembly therebetween is obtained,

I. latch means for coupling said closure in releasably fixed position relative to one of said walls of said housing means, and

J. said latch means includes:

(1) at least a pair of flexible latch members extending outwardly from said inner end of said closure,

(2) openings disposed on said guide means to provide a nest for receiving said latch members therein, and

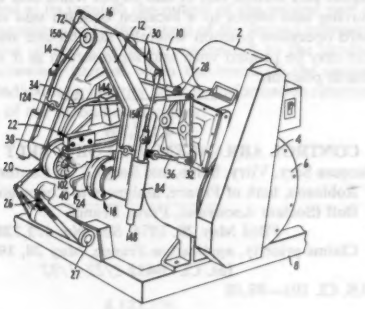
(3) said latch members being received in said openings when said valve is in operative relationship with said coupling means.

4,122,765

APPARATUS FOR PITTING FRUITS OR DRUPE TYPE

Jesus A. Silvestrini, Mendoza, Argentina, assignor to California Processing Machinery, San Ramon, Calif.

Continuation-in-part of Ser. No. 639,706, Dec. 11, 1975. This application Aug. 8, 1977, Ser. No. 822,669
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[2] A23N *4/22*
U.S. Cl. 99—551 6 Claims



1. Apparatus for bisecting and pitting fruits of the drupe type, comprising

means for receiving such a fruit, producing a partial cut in its pulp and thus defining two fruit halves adhered to the pit of said fruit, and gripping said pit,

means for gripping the outer surfaces of said two fruit halves, said gripping means comprising

a pair of opposed gripper heads, one each disposed on opposite sides of said fruit receiving and cutting means and each generally adjacent a respective one of said fruit halves, each said gripper head having a cavity facing said fruit receiving and cutting means,

means for moving said gripper heads between a position distal said fruit receiving and cutting means and a position proximal said fruit receiving and cutting means in which said gripper heads substantially surround their respectively adjacent said fruit halves,

an elastic, cup-like diaphragm element extending within and continuously across each said gripper head cavity for resiliently engaging and releasably gripping the outer surface of the respective said fruit halves and preventing contact between said fruit and other portions of said gripper head within said cavity when said gripper heads are in their fruit half surrounding positions,

means for supplying a pressurized operating fluid into the spaces between each said gripper head cavity and its respective diaphragm element, whereby the introduction of such pressurized fluid into the spaces between such cavities and diaphragm elements will cause the diaphragm elements to be elastically deformed so as to adapt those diaphragm elements to the shape of the respective fruit halves and thus grip those fruit halves,

valve means for controlling selective introduction and release of said pressurized fluid within said spaces, whereby such introduction and release of such pressurized fluid will effect selective gripping and release of the fruit by the gripping means, and

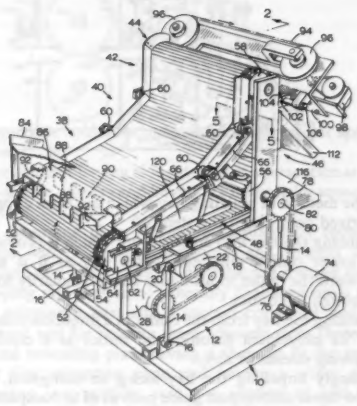
means for rotating said gripping heads in opposite directions about an axis extending through said fruit while said diaphragm elements grip said fruit halves, whereby the fruit halves may be freed from one another and from the pit.

4,122,766

FRUIT AND VEGETABLE DECAPPING MACHINE

Richard L. Ledebuhr, Haslett; Clarence M. Hansen, E. Lansing, and Richard J. Patterson, Okemos, all of Mich., assignors to Michigan State University, East Lansing, Mich.

Continuation-in-part of Ser. No. 469,164, May 13, 1974, abandoned. This application Jul. 26, 1976, Ser. No. 708,515
Int. Cl.[2] A23N *15/02*
U.S. Cl. 99—640 17 Claims



1. A machine for detopping fruits and vegetables by severing therefrom the top portion including a cap, if present, the machine comprising:

a frame;

a sub-frame;

means mounting the sub-frame to the frame for orbital motion relative to the frame in two directions transverse to one another and having at least a component in the horizontal plane;

drive means connected to the sub-frame for moving the sub-frame relative to the frame in the said orbital motion;

an upwardly-inclined conveyor mounted by the sub-frame for conveying fruits and vegetables upwards thereon from a receiving station on the upwardly-moving part thereof and to a severing station at which the said top portions are severed;

the conveyor including gripping means operative over the part of its path between the receiving and severing stations for gripping the fruits and vegetables on the conveyor by their tops with the bodies of the fruits and vegetables extending away from the conveyor and, so that gripped, topped fruits and vegetables will be conveyed upwards from the receiving station away from the conveyor;

the said orbital motion of the sub-frame and the conveyor changing the orientation of the fruits and vegetables on the conveyor to facilitate their gripping by the conveyor gripping means; and

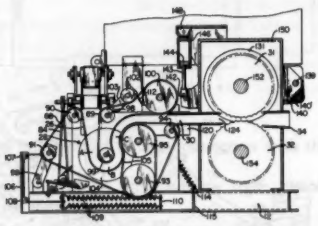
knife means at the severing station for severing the tops from the fruits and vegetables delivered thereto by the conveyor.

4,122,767

METHOD OF PRODUCING PRESSED HAY PELLETS

Ronald T. Jarrett, 1625 Knight St., and Edward J. Barrett, 521 S. Tamarack, both of Helena, Mont. 59601, assignors to Ronald T. Jarrett; Edward J. Barrett, both of Helena and D. Michael Curran, Great Falls, all of, Mont.

Division of Ser. No. 518,255, Oct. 29, 1974, Pat. No. 3,973,484.
This application May 28, 1976, Ser. No. 691,138
Int. Cl.[2] B30B *5/06, 11/00*
U.S. Cl. 100—35 11 Claims



1. The method of pelleting hay which has been chopped and moisturized comprising the steps of:

advancing the hay into an enclosure which is provided with a lower outlet, intercepting the hay as it is advanced toward the outlet to lift it and beat it primarily to passage through the outlet;

advancing the hay from the outlet in a direction transversely of its movement through the outlet as a continuously moving stream of hay;

yieldingly impelling the hay along an elongated, flexible, non-linear convergent guide path so as to compact the hay to increase its density, followed by

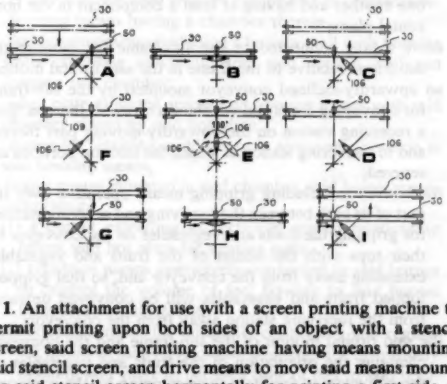
separating the stream of hay into distinct portions and further compressing each portion into compact cubicle form.

4,122,768

SCREEN PRINTING PRESS ATTACHMENT FOR PRINTING OBJECTS OF REVOLUTION

Jean-Louis Dubuit, Paris, France, and Charles H. Derrickson, Chicago, Ill., assignors to Dubuit of America, Inc., Chicago, Ill.

Filed Apr. 19, 1977, Ser. No. 788,911
Int. Cl.[2] B41F *17/22*
U.S. Cl. 101—39 6 Claims



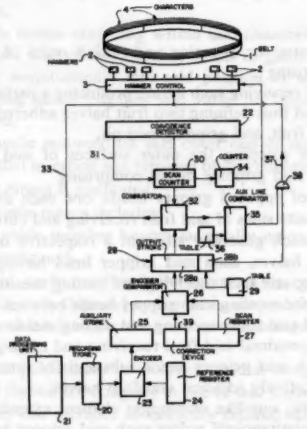
1. An attachment for use with a screen printing machine to permit printing upon both sides of an object with a stencil screen, said screen printing machine having means mounting said stencil screen, and drive means to move said means mounting said stencil screen horizontally for printing a first side of said object, to then return said means mounting said stencil screen, and to then again move said means mounting said stencil screen horizontally for printing a second side of said object, and squeegee means in engagement with said screen to force ink onto said object, said attachment including workholder means for rotating said object to be printed in timed relationship with horizontal movement of said screen, said squeegee means being in an operative position over said screen to print said object while said screen is moving horizontally from a first position to a second position to print on said first side of said object, means carried on said means mounting said stencil screen to shift said screen from said second operative position to a third operative position while said drive means returns said means mounting said screen, inverter means on said workholder means to rotate said object to be printed to expose said second side of said object while said workholder is moving said object to a location beneath said screen in said third operative position whereby said second side of said object may be printed with said same screen as it is moved to a fourth position.

4,122,769

CONTROL ARRANGEMENT FOR A BELT PRINTER

Jacques Sery, Vitry, Seine, and Serge A. E. Couture, Le Plessis-Robinson, both of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed May 20, 1974, Ser. No. 471,728
Claims priority, application France, May 28, 1973, 73 19329
Int. Cl.[2] B41J *1/22, 1/32*
U.S. Cl. 101—93.18 5 Claims



1. In a control arrangement for a belt printer having characters arranged in successive series on the belt and passing continuously in the front of a print support and hammers arranged for controlled striking of these characters in response to actuation of a control device, the improvement comprising a recording store for recording information relating to each character to be printed along a line on the said support; a calculating unit having its input connected to the output of said recording store; a scan register containing information relating to the coincidences between the characters and the hammers at any given time; storage means connected to said calculating unit, said storage means being divided in two parts including a first part containing first information indicating that a predetermined character in a line is to be struck by a given hammer in the course of a given scan; and a second part containing second information indicative of whether or not this predetermined character is repeated in the series of characters; first comparator means for effecting a first comparison, said first comparator means having two inputs and two outputs, one input of said first comparator being connected to the output of the first part of the storage member, the other input of said comparator being connected to the output of the scan register, one output of said first comparator being connected to the control device

for actuation thereof when the result of the first comparison indicates an identity between first information of storage member and information contained in the scan register; reference means containing for each of the various series of characters, information relating to the distance of the different points at which a repeated character is situated; means for effecting a second comparison, said second comparison means having two inputs and an output, one of said inputs of said second comparator means being connected to the other output of the first comparator, the other of said inputs of the second comparator being connected to the output of the reference device; and a gate connected at its input to the output of the second part of the storage member and to the output of the second comparator, the output of this gate being connected to the control device for actuation thereof when the result of the second comparison indicates an identity between information received at the inputs of the second comparator.

4,122,770

SERIES PRINTER

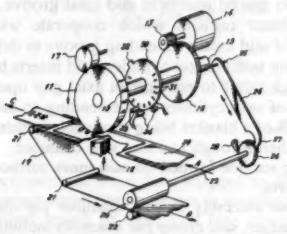
Shoji Umeda, Kobe, and Akio Yoshikawa, Takasago, both of Japan, assignors to Yamato Scale Company, Ltd., Japan

Filed Apr. 19, 1977, Ser. No. 788,837

Claims priority, application Japan, Apr. 23, 1976, 51/51697[U]; Mar. 10, 1977, 52/29248[U]

Int. Cl.² B41J *1/22*

U.S. Cl. 101—93.19 **3 Claims**



1. A series printer, comprising a type drum having a plurality of radially spaced coplanar types on the periphery and being fixed to a shaft for continuous rotation, a pulse generating device interlocked with said shaft for generating pulses in response to the respective passage of said types through a predetermined printing position, a printing hammer facing said type drum at said printing position, said pulse generating device including a type signal generator for counting said pulses to discriminate the type signal representing each type, a printing signal generator for generating a printing signal designating a type to be printed, hammer actuating means including a coincidence signal actuating said printing hammer, and printing said printing signal generator for comparing said type signals with the printing signal and producing a coincidence signal when the type signal is identical to the printing signal, said coicidence signal actuating said printing hammer, and printing paper feeding means feeding a printing paper through said printing position, said printing paper feeding means comprising a feed roller and a ratchet drive mechanism having a pawl coupled with and reciprocated by rotation of the shaft of said type drum and providing said feed roller with intermittent rotation, and means disabling the hammer actuating means during rotation of said feed roller.

4,122,771

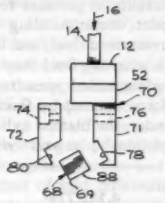
SQUEEGEE HOLDER

James G. Barton, San Clemente, and James R. Ford, Sebastopol, both of Calif., assignors to General Dynamics, Pomona, Calif.

Filed Apr. 13, 1977, Ser. No. 787,185

Int. Cl.² B41F *15/44*

U.S. Cl. 101—123 **1 Claim**



1. A squeegee holder for use in a thick film printer apparatus comprising:

a wiper element having elongated sides intersection at generally square corners and having a substantially square cross section;

a first mounting plate forming a substantially rectangular recess with a straight horizontal and straight vertical surface, said first mounting plate having a wiper element-gripping jaw portion of generally U-shaped cross section for gripping a first and a second corner of said wiper element and for holding three adjacent sides thereof; and

a second mounting plate having a shape to fit the recess of said first mounting plate and having a wiper element gripping jaw portion, said jaw portion of said second mounting plate forming a right-angular recess for gripping two adjacent sides and one corner of said wiper element, whereby the fourth corner of said wiper element remains exposed, a diagonal passing through said exposed corner and the opposite corner forming an angle of approximately 15° with a vertical plane passing between said mounting plates.

4,122,772

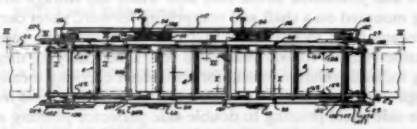
HYDROSTATIC BEARER FOR PRINTING PRESS

Harold P. Dahlgren, Dallas, Tex.

Continuation of Ser. No. 207,499, Dec. 13, 1971, abandoned, which is a continuation-in-part of Ser. No. 737,521, Jun. 17, 1968, Pat. No. 3,664,261. This application Aug. 9, 1974, Ser. No. 495,979

Int. Cl.² B41F *7/04*; F16C *7/04*

U.S. Cl. 101—218 **1 Claim**



1. In a sheet-fed lithographic offset printing press, a feeder station; a delivery station; at least one cylinder support, including spaced side members intermediate the feeder and delivery stations; a plate cylinder journaled between the side members, said plate cylinder having a longitudinally extending gap; a blanket cylinder journaled between the side members, said blanket cylinder having a longitudinally extending gap; an impression cylinder journaled between the side members adjacent the blanket cylinder; means to urge said plate cylinder and said blanket cylinder into rolling pressure relation; means to urge said blanket cylinder and impression cylinder into pressure relation; means for applying ink to the plate cylinder; gripper members adapted to receive and grip an edge of a sheet

at the feeder station and continuously convey a sheet between the surfaces of the blanket cylinder and the impression cylinder to the delivery station; continuous transfer means movably extending from the feeder station to the delivery station; means securing said gripper members to said transfer means; means to rotate said plate cylinder, blanket cylinder and impression cylinder; hollow bushings about ends of the plate cylinder, the blanket cylinder, and the impression cylinder, each of said bushings having a plurality of pressure recesses spaced about the inner side; an inlet communicating with each pressure recess; a source of pressurized fluid; and lines connecting said source and said inlets whereby fluid may be supplied to each pressure recess at predetermined pressure, said recesses being arranged such that force exerted by fluid pressure maintains axes of the plate cylinder, the blanket cylinder and impression cylinder in a fixed relationship as said cylinders rotate.

4,122,773

CHANGE-OVER MEANS FOR A STORAGE DRUM FOR SHEET TRANSFERRAL

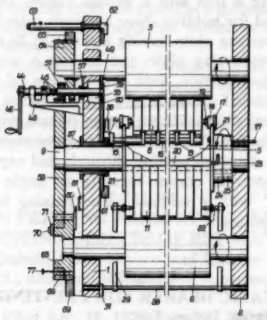
Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Continuation of Ser. No. 571,257, Apr. 24, 1975, abandoned. This application Apr. 20, 1977, Ser. No. 789,009

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1974, 2419747

Int. Cl.[2] B41F *5/02, 1/30*

U.S. Cl. 101—230 **15 Claims**



1. In an assembly of a sheet-transfer drum, a sheet-turning drum and a storage drum located therebetween for transporting a sheet between individual printing units of a rotary printing press having two side walls disposed opposite and spaced from one another, the drums being disposed in the space between and journalled in the two side walls, the storage drum being mounted on a shaft and comprising forward sheet carrying means fixed to said shaft and rear sheet carrying means rotatable relative to said shaft, said rear sheet carrying means being lockable relative to said forward sheet carrying means, a change-over mechanism for converting the printing press from single-side sheet printing to double-side perfector printing and conversely as well as to different format sizes, the change-over mechanism being provided exclusively in that drum of the assembly of drums which is the storage drum and comprising a control shaft extending from a location outside said change-over mechanism through one of said side walls and being axially displaceable to at least first and second control positions, first and second control pinions mounted on said control shaft, a plurality of drive wheels couplable with said first control pinion, in said first control position of said control shaft for converting the printing press from single-side sheet printing to double-side perfector printing, means for guiding and holding a sheet disposed on the storage drum, gripper-release means for adjusting the format size for perfector printing, and a control member coupled with said gripper-release means, said first control pinion, in said second control position of said control shaft, meshing with one of said drive wheels for adjusting said means for guiding and holding a sheet, and said second control pinion, in said second control position of said control shaft, meshing with said control member for adjusting the format size.

4,122,774

BLANKET CLAMPING APPARATUS

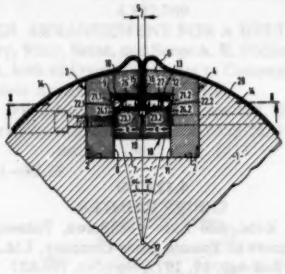
Hartmut K. Sauer, Himmelstadt, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed May 24, 1977, Ser. No. 800,115

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631119

Int. Cl.[2] B41F *27/00*

U.S. Cl. 101—415.1 **18 Claims**



1. A blanket clamping and tensioning apparatus for a blanket cylinder having an axially extending groove at its periphery, said clamping and tensioning apparatus comprising:

at least two spaced inserts in said axial groove, said inserts having inner surfaces which cooperate with an inner surface of said axially extending groove to define a chamber within said blanket cylinder, said inserts being spaced from each other to provide an axial gap open at the periphery of said cylinder and extending to said chamber, the edges of a blanket being receivable within said gap to extend therethrough and into said chamber;

a camming surface formed on said inner surface of each of said inserts;

a clamp bar assembly in said chamber for clamping said blanket edges, said clamp bar assembly including a slot for receiving said blanket edges, said clamp bar assembly being radially movable and having means contacting said camming surfaces for movement thereby upon radial movement of said clamp bar assembly to effect clamping of said blanket edges within said slot and tensioning of said blanket; and

means to secure said clamp bar assembly in a desired position.

4,122,775

LAND MINE OF THE HOLLOW-CHARGE TYPE

Manfred Held, Aresing, Germany, assignor to Messerschmitt-Bölkow-Blöhm GmbH, Munich, Germany

Filed Jun. 1, 1977, Ser. No. 802,420

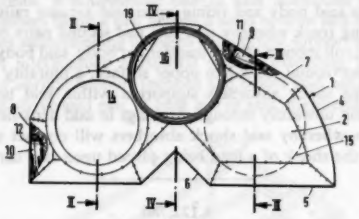
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624927

Int. Cl.[2] F42B *23/24*

U.S. Cl. 102—8 **8 Claims**

1. A land mine, of the hollow-charge type, comprising a flat mine housing having top and bottom flat broad surfaces and a side edge which is at least partially cylindrical, a tubular bushing in said housing extending between said top and bottom, a firing system in said tubular bushing, a bushing cover enclosing said bushing, an explosive charge in said housing between said flat board surfaces, and at least one projectile-forming cover

engaged over the explosive charge on the top and bottom of said housing and forming a part of said broad surface, the

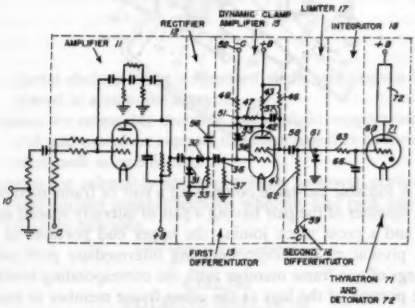


projectile-forming covers on respective opposite broad sides being offset from each other.

4,122,776
DYNAMIC CLAMP CIRCUITS

Paul M. Tedder, Gainesville, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 3, 1954, Ser. No. 454,237
Int. Cl.[2] F42B *5/08, 9/08, 21/38*
U.S. Cl. 102—214 **2 Claims**

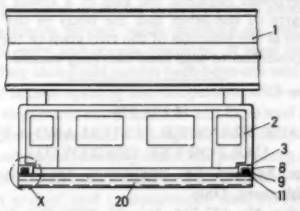


1. An electronic ordnance fuze adapted to function upon receiving a target signal that increases in amplitude for at least a predetermined length of time, said fuze comprising: input means adapted to receive an alternating-current signal of increasing amplitude; first means for obtaining from said alternating-current signal a first negative-going unipotential signal of increasing amplitude, a ripple frequency due to the original alternating current being superimposed on said unipotential signal; an amplifier tube having at least a control grid, a screen grid, and an anode; means for applying said negative-going unipotential signal to said control grid; sources of direct current supply voltage for said screen grid and said anode, the voltage at the screen grid being maintained more positive than the voltage at the anode and the operating conditions being so maintained that the anode current remains substantially saturated for control grid signals more positive than a predetermined negative value; means for taking an amplified unipotential signal from said screen grid, said screen grid thus resembling functionally the plate of a triode amplifier; first and second capacitor means for coupling said ripple frequency present in said first negative-going unipotential signal to said screen grid and to said anode, said capacitor means tending to filter out said ripple, the degree of filtering being dependent upon the gain of said amplifier tube; means for obtaining a direct-current feedback voltage from said anode; a biased diode; means for applying said feedback voltage to said control grid through said biased diode, so that, if said alternating-current signal is of sufficient amplitude and increases in amplitude at an abnormally large rate, a direct-coupled inverse feedback voltage is applied to said control grid, reducing the gain of said amplifier but permitting the ripple-frequency output of said amplifier to increase; resistance-capacitance differentiator means adapted to produce a unipotential output signal upon receiving a positive-going unipotential signal from said screen grid of said amplifier; diode rectifier-limiter means connected between the output of said differentiator means and ground, said rectifier-limiter means serving to prevent the output of said differentiator means from rising appreciably above ground potential and serving also to rectify any component of said ripple frequency present in the input of said differentiator means, so as to make the output of said differentiator means more negative when the ripple-frequency output of said amplifier increases; resistance-capacitance integrator means connected to the output of said differentiator means; a thyratron; means for applying to the grid of said thyratron a signal from the output of said integrator means; and fixed bias means for maintaining the output of said differentiator and the grid of said thyratron a values sufficiently negative to prevent firing of said thyratron in the absence of a signal.

4,122,777
RAILWAY MAINTENANCE CAR

Udo Dietrich, Gevelsberg, Germany, assignor to Demag A.G., Duisburg, Germany

Filed Jan. 14, 1977, Ser. No. 759,538
Claims priority, application Fed. Rep. of Germany, Jan. 17, 1976, 2601593
Int. Cl.[2] B61B *3/00*
U.S. Cl. 104—89 **12 Claims**



1. Maintenance apparatus for elevated railways, comprising
(a) an elevated rail right of way;
(b) a maintenance car for said rail right of way; characterized by
(c) said maintenance car operable on said rail right of way;
(d) a transverse rail disposed on each end of said car;
(e) a cross carrier movable on said transverse rails;
(f) a maintenance access platform extendable from said cross carrier for moving personnel adjacent an area to be repaired and maintained;
(g) a maintenance floor on said platform;
(h) a longitudinal slot in said floor;
(i) a floor suspension disposed on said cross carrier;
(j) said floor suspension extending through said maintenance floor slot;
(k) rollers on said floor suspension; and
(l) said floor supported on said suspension rollers.

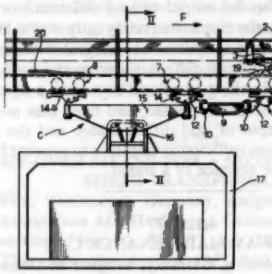
4,122,778
DAMPED SUSPENDED CONVEYOR TROLLEY

Getano Di Rosa, Pino Torinese (Turin), Italy, assignor to F.A.T.A - Fabbrica Apparecchi Di Sollevamento E Trasporto Ed Affint S.p.A., Turin, Italy

Continuation-in-part of Ser. No. 625,227, Oct. 23, 1975, abandoned. This application May 19, 1977, Ser. No. 798,560
Claims priority, application Italy, Jul. 4, 1975, 68736 A/75
Int. Cl.[2] B61B *3/00, 9/00, 13/00;* **B61F** *13/00*
U.S. Cl. 104—172 S **1 Claim**

1. A load carrier for aerial conveyors of the double rail type

comprising load carrying means, front trolley means and rear trolley means operably connected to said load carrying means and shock absorbing means mounted on said front trolley means for dissipating kinetic energy associated with the starting and stopping of the load carrier, said front trolley means comprising a body, a rod pivoted at one end to said body and pivotally connected at the other end to said load carrying means and said shock absorbing means connected at one end to said body and at the other end to said rod adjacent the said other end of said rod, said shock absorbing means extending



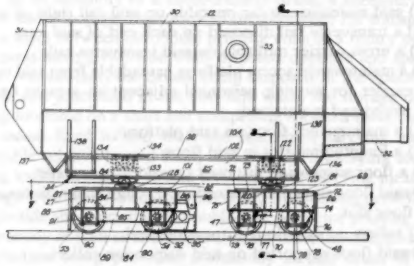
substantially in the plane of the direction of movement of the load carrier; said rod being in the form of a right-angled lever having an upstanding vertical arm hinged at its upper end to the body of the trolley for pivotal movement about a horizontaly axis perpendicular to the direction of displacement of the trolley and said shock absorbing means comprising a telescopic damper interposed between the end of a lower substantially horizontal arm of the lever and the body of the trolley, the elbow region at the junction of the two arms of the lever being pivotally connected to said load carrying means.

4,122,779

DUAL TRACK TRANSFER SYSTEM AND A TRANSFER CAR FOR USE THEREWITH

Earl C. Vice, Ashland, Ky., assignor to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 677,711, Apr. 16, 1976, Pat. No. 4,043,466.
This application Jan. 21, 1977, Ser. No. 760,914
Int. Cl.[2] B61F *5/30*
U.S. Cl. 105—199 R **5 Claims**



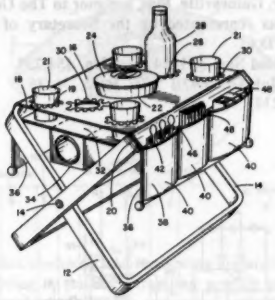
1. A transfer car for use with a dual track transfer system between first and second stations utilizing standard railroad-type rail and causing said transfer car to be turned at said second station at least 90° to its direction of travel immediately prior to its turning, said transfer car comprising a body, a lead truck and a following truck each having at least four standard flanged wheels, means to pivotally affix said lead and following trucks to said body, each of said lead and following trucks having a flat, horizontally oriented, deck-like upper surface supporting flat arcuate rails, said body having a first pair of rollers located to either side of said pivot means joining said lead truck to said body and riding upon said arcuate rails of said lead truck, said body having a second pair of rollers located to either side of said pivot means joining said following truck to said body and riding upon said arcuate rails of said following truck whereby said first and second pairs of rollers prevent roll motion of said transfer car body, said body having a flat, horizontal, deck-like upper surface, a plurality of draft gear-type shock absorbers supported within said body and extending upwardly through openings in said deck-like upper surfaces whereby said shock absorbers will contact and will absorb the shock of a load being placed upon said car body.

4,122,780

FOLDABLE BAR-TABLE

Harold Brickman, Chicago, Ill., assignor to Ever-Wear, Inc., Chicago, Ill.

Filed Oct. 25, 1977, Ser. No. 844,610
Int. Cl.[2] A47B *85/00*
U.S. Cl. 108—25 **6 Claims**



1. A foldable bar-table comprising a pair of frame members, each member of the pair having a pair of laterally spaced apart legs and a cross piece joining the upper end portions of the legs, pivotal means interconnecting intermediate portions of the legs of one frame member with the corresponding intermediate portion of the legs of the other frame member to enable relative rocking movement of the frame members about a pivotal interconnection between open and folded positions, upper and lower fabrics of flexible, non-stretchable material extending crosswise between the cross pieces and dimensioned to have a length corresponding to the spaced relation between side cross pieces when in open position, the lower fabric being spaced a short distance below and substantially in parallel relation with the upper fabric when in open position, openings in the upper fabric dimensioned to correspond with the cross section of containers to be retained thereby whereby said containers can extend through said openings into engagement for support by said lower fabric.

4,122,781

SELF SERVICE PLANT SALES RACK

John M. Potter, 1828 S. Woodhouse, Virginia Beach, Va. 23454

Filed Jul. 19, 1977, Ser. No. 816,971
Int. Cl.[2] A47B *81/00*
U.S. Cl. 108—101 **1 Claim**

1. A self service plant sales rack assembly for displaying and storing a plurality of different plants in containers, said rack assembly comprising:

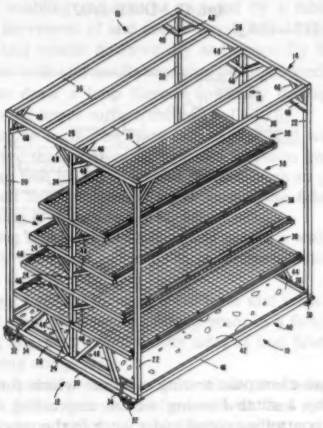
at least first and second upright support sections, each of said sections including a main upright column and at least one peripheral upright column, said main and peripheral upright columns on each of said upright support sections being joined at an upper portion by a top cross bar;

a plurality of generally horizontal plant container support members, uppermost ones of said horizontal support mem-

bers being elongated hanger bars extending between said top cross bars of adjacent ones of said upright support sections, a bottommost one of said horizontal support members being a pan having a solid bottom and upraised sides and extending between said upright support sections, and intermediate horizontal shelves extending between said upright support sections and below said hanger bars and above said pan, at least one of said intermediate horizontal shelves being a screened shelf, said shelves being placed in a step-like array;

means for releasably securing said upright support sections and said container support members together to form said sales rack assembly; and

means for releasably securing wheels to lower portions of said upright support sections whereby said rack assembly may be movable.



4,122,782

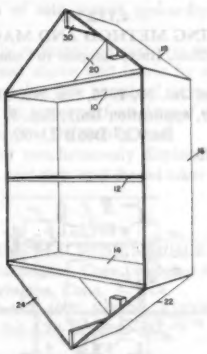
FOLDING SHELVING

John F. Coombs, 531 Main St., Worcester, Mass. 01608

Filed Apr. 15, 1977, Ser. No. 787,945

Int. Cl.[2] **A47B** *3/00*

U.S. Cl. 108—111 **5 Claims**



1. A folding shelving unit comprising a plurality of shelves of like length and width, a flexible belt surrounding the same being secured thereto at the ends thereof, said belt having at the top thereof a length of material greater than the length of the shelf adjacent thereto, and a single rigid top supporting member under the same at the top portion thereof forming a top compartment of inverted V shape, and means rigidly supporting the supporting member.

4,122,783

APPARATUS FOR PROTECTING A ROOM AGAINST PENETRATION THEREINTO OF ARMED PERSONS

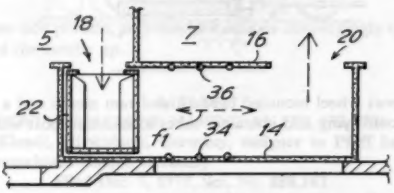
Gisberto Pretini, S. Frediano a Settimo, Pisa, Italy

Filed Jan. 26, 1977, Ser. No. 762,803

Claims priority, application Italy, Jan. 30, 1976, 9329 A/76

Int. Cl.[2] **E05G** *5/02*

U.S. Cl. 109—3 **15 Claims**



1. In apparatus for protecting a room against penetration thereinto of armed persons, of the type including a locking system for access door means for the room, the improvement comprising, in combination, a movable compartment constituting said access door means and which must be entered by a person at an entry opening and moved along an access path to an access opening in order for such person to enter said room, said compartment having walls defining an enclosure open toward said entry and access openings; at least one fixed side wall extending along said access path between said entry opening and said access opening and cooperable with said compartment walls to prevent entry into and exit from said enclosure of said movable compartment except at said entry and access openings; and respective magnetic field producing components on a pair of spaced apart walls included in said walls of said access path and of said compartment, and between which a person must pass to proceed from said entry opening to said access opening; said magnetic field components producing a magnetic field therebetween constituting detector means operable to detect the presence of ferromagnetic masses, such as weapons, carried by a person within said movable compartment as said compartment moves along said access path; said movable compartment, upon such detection of the presence of a ferromagnetic mass thereinto, being arrested at a position along said access path preventing a person, in said movable compartment, entering said room.

4,122,784

METHOD AND APPARATUS FOR THE REGENERATION OF LAWN SURFACES IN PARTICULAR OF GRASS SPORT PITCHES

Siegfried Joswig, Kausen, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Betzdorf, Fed. Rep. of Germany

Filed Mar. 1, 1977, Ser. No. 773,411

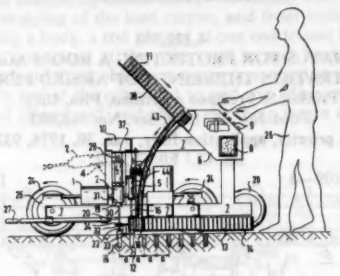
Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628548

Int. Cl.[2] **A01C** *11/00*

U.S. Cl. 111—3 **6 Claims**

1. Completely automatic apparatus for inserting tubular plugs, initially contained in hollow container tubes into a turf area, said apparatus including a chassis, drive means on and driving said chassis a predetermined distance for each cycle of operation, drilling means for drilling holes in the turf area, automatic feed means including ram means for pushing said plugs from said container tubes for selectively inserting said

tubular plugs in holes drilled in said turf area by said drilling means, wherein said automatic feed means includes an interval



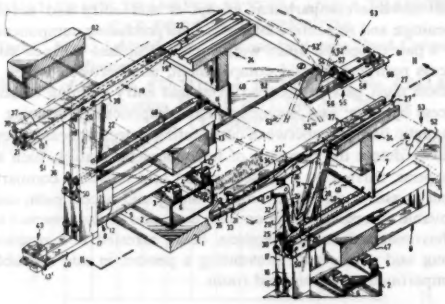
transport wheel mounted beneath said ram means and a feed hose conveying said container tubes to said transport wheel.

4,122,785

WORKPIECE SUPPORT FOR SEWING DEVICES

Hans Scholl, Oerlinghausen-Lipperreihe, and Horst Bernewasser, Steinhagen, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,709
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.15 **5 Claims**



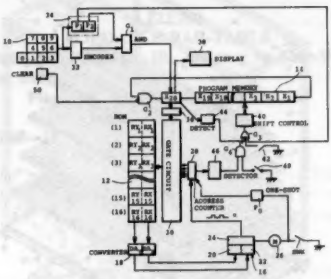
1. A workpiece holder for sewing machines comprising a plurality of supporting elements located next to one another and displaceable relative to one another; needles located at a rim zone of said supporting elements for supporting the edge of a workpiece to be processed, and means lowerable onto the workpiece and cooperating with the needles for holding the workpiece on said needles; contour adjusting means having templates for shifting said supporting elements, said templates having contours corresponding to seams to be applied to said workpiece; said supporting elements comprising rails of U-shaped cross-section and having crossbars for carrying said workpiece, said crossbars having recesses for permitting passage of said needles; a two-arm lever rotatably supported in each of said supporting elements, said needles being arranged on said two-arm lever; and spring means for holding said needles in a position permitting passage through said support elements within said recesses, said workpiece being supported unclamped by said needles.

4,122,786

PROGRAMMABLE STITCH PATTERN FORMING CONTROL IN AN ELECTRONIC SEWING MACHINE

Akira Tanimoto, Kashihara; Sanao Katoh, Yamatokoriyama, and Yukihiro Yoshida, Ikoma, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1977, Ser. No. 796,238
Claims priority, application Japan, May 14, 1976, 51-55555; Jun. 18, 1976, 51-72426; Jun. 23, 1976, 51-74837
Int. Cl.² D05B *3/02*
U.S. Cl. 112—158 E **24 Claims**



1. In an electronic sewing machine which forms a stitch pattern by a stitch forming section responding to a needle position controlling signal and a work feed controlling signal, the improvement comprising:

a memory means for storing digital stitch information related to plural kinds of stitch patterns;

input means for selecting a desired stitch pattern stored in said memory means;

a program memory for storing a plurality of selection commands derived from said input means in the order of the selection operation conducted through said input means;

control means for sequentially developing the digital stitch information related to the stitch pattern which is selected by said selection command stored in said program memory; and

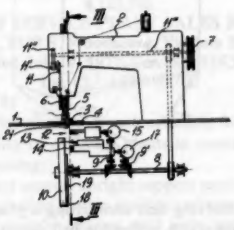
means for applying the digital stitch information developed by said control means to said stitch forming section as the needle position controlling signal and the work feed controlling signal.

4,122,787

SEWING METHOD AND MACHINE

Roberto Conti, Milan, Italy, assignor to Complett S.p.A., Milan, Italy

Filed Jul. 30, 1976, Ser. No. 710,138
Claims priority, application Italy, Sep. 5, 1975, 26954 A/75
Int. Cl.² D05B *23/00*
U.S. Cl. 112—170 **7 Claims**



1. A method of forming a stitched seam in a fabric with stitches lying alternately on opposite sides of the fabric, said method comprising the steps of:

(a) forming a length of thread above said fabric;
(b) engaging said length of thread in a laterally open eye of a needle and entraining a loop of said thread downwardly through said fabric to carry said loops below said fabric;
(c) releasing said thread from said eye and engaging said loop in a rotating hook disposed below said fabric to draw the free length of said thread downwardly through said fabric while raising said needle through said fabric;
(d) retaining the free length of thread below said fabric in a position enabling same to be engaged by a subsequent upward movement of said needle through said fabric, and passing said needle downwardly and upwardly through said fabric with said needle engaging the positioned thread length to draw a loop thereof upwardly through said fabric to the upper surface thereof;
(e) swinging an oscillating hook into engagement with said loop above the upper surface of said fabric to guide the remaining free length of thread therethrough to prevent the thread from tightening itself around the fabric and maintaining it alongside the needle;
(f) advancing said fabric each time said needle is withdrawn upwardly from said fabric to form alternate stitches on opposite sides thereof; and
(g) repeating steps (a) through (f) to form said seam.

2. A sewing machine for stitching a seam in a fabric with stitches lying alternately on opposite sides of said fabric, said sewing maching comprising:
(a) support means provided with a stitch plate adapted to receive a fabric thereon and formed with feed means for the stepwise advance of said fabric passing a stitching location;
(b) an arm extending over said stitch plate and provided with a presser foot and retaining said fabric against said stitch plate at said location;
(c) a needle vertically reciprocatable on said arm at said location for passing downwardly and upwardly through said fabric, said needle having a laterally open eye of double-hook configuration;
(d) a disk rotatable below said stitch plate and formed with a hook engageable with a loop of a free length of thread entrained downwardly through said fabric for disengagement of said thread from said eye and drawing out said length of thread below said fabric;
(e) a thread taker disposed below said stitch plate and engageable with the drawn out length of thread for holding same in a position for engagement in said eye upon a subsequent upstroke of said needle whereby said needle entrains a loop of said thread upwardly through said fabric;
(f) a hook pivotally mounted on said arm engageable with the loop entrained above said fabric by said needle for guiding the remaining free length of thread through said fabric and onto the upper surface thereof while maintaining the thread against the needle; and
(g) drive means for synchronously displacing said needle, said feed means, said disk, said thread taker and said hook.

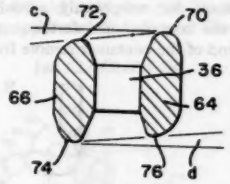
4,122,788

SEWING MACHINE NEEDLE

James P. Hickson, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Oct. 3, 1977, Ser. No. 838,485
Int. Cl.[2] D05B *85/00*
U.S. Cl. 112—222 **2 Claims**

1. In a sewing machine needle having a leading end, a blade, and a shank for fitting the needle into a sewing machine needle holder, said needle having an eye located in the area of the front of the blade and the back of the leading end and extending from the top to the bottom of the needle: the top of one side portion of the needle formed by the eye extends further from a horizontal plane through the axis of the needle than the top of the other side portion, and the bottom of said other side portion extends further from said horizontal plane than the bottom of



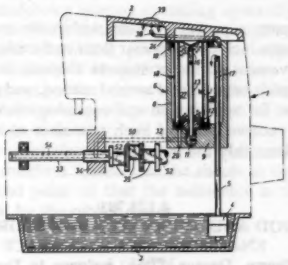
said one side portion, and the side portions convergingly taper toward the needle tip.

4,122,789

SEWING MACHINE HAVING AN OIL FILTER

Kurt Klundt, Hirschhorn, Germany, assignor to Pfaff Industriemaschinen GmbH, Germany

Filed Dec. 7, 1977, Ser. No. 858,162
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 7640656[U]
Int. Cl.[2] D05B *71/00*
U.S. Cl. 112—256 **8 Claims**



1. A sewing machine with a forced lubrication system, comprising an oil pan, a filter arranged above said oil pan, said filter having a housing, a removable filter insertable in said housing, said filter housing having an oil return bore defined therein in a position so that it is closed by insertion of said filter insert into said housing into an operative position therein, said oil return bore being cleared and opened when said filter insert is not in an operative position.

4,122,790

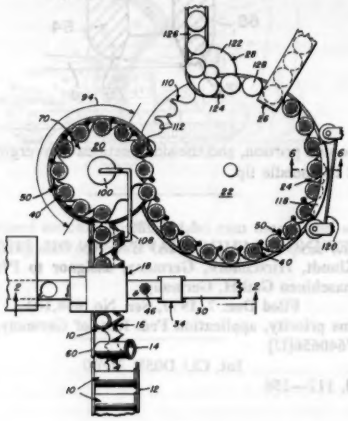
PEEL-TOP CONTAINER ASSEMBLY SYSTEM

E. Riley Rowe; Wade Fletcher; Herman R. Markert, and Dwight D. Grady, all of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed May 12, 1977, Ser. No. 796,216
Int. Cl.[2] B21D *51/44*
U.S. Cl. 113—120 R **13 Claims**

1. A high speed system for mounting end closures on containers, said system comprising means for introducing a series of containers to a given path, first conveying means for moving the series of containers along the given path, through a first station, means at said first station for forming and positioning a thin flexible generally planar membrane on one end of each container, second conveying means beyond said first conveying means and cooperating therewith for continuous movement of the containers beyond the first station, along the given path and through multiple subsequent stations, a second station along said path beyond said first station, means at said second

station for sealing each membrane to its associated container as the container moves continuously therethrough, means for retaining each membrane on the associated container as it moves along the path between the first and second stations comprising means for temproarily adhesively tacking the membrane to the container and further comprising vacuum means at the end of the container remote from the membrane



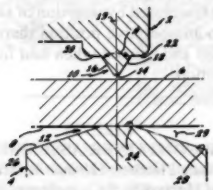
for developing a partial vacuum within the container, said vacuum means including a planar floor surface for support and sliding movement of the containers thereon, a third station along said path beyond said second station, and means at said third station for applying an end enclosing overcap over the membrane received end of each container as the container moves continuously therethrough.

4,122,791

METHOD AND APPARATUS FOR SCORING AN ENAMELED METAL SURFACE

Omar L. Brown, Dayton, Ohio, assignor to Dayton Reliable Tool & Manufacturing Company, Dayton, Ohio

Filed Jun. 30, 1977, Ser. No. 811,958
Int. Cl.[2] B21D *51/38*
U.S. Cl. 113—121 C **12 Claims**



1. A method for scoring an enameled metal sheet to form a line of weakness in said sheet while minimizing disruption of the enamel coating on said sheet during scoring, said method comprising:

placing the enameled lower surface of the metal sheet in contact with an anvil;

said anvil having a flat surface portion which underlies the desired line of score on the metal sheet;

said flat surface portion extending a short distance on either side of the desired line of score;

said anvil having angled surface portions which extend downwardly from said flat surface portion to create void spaces between the angled surface portions and said metal sheet;

bringing a scoring tool into forcible contact with the upper surface of the metal sheet along the desired line of score;

said scoring tool having a scoring edge and inclined side surfaces which are angled inwardly toward the scoring edge with the side surfaces displacing metal in said sheet in a downward and transverse direction away from the line of score as the scoring tool makes forcible contact with the metal sheet, and

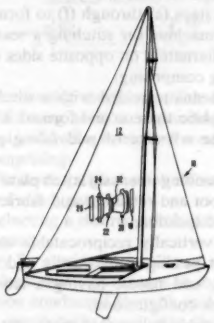
providing said angled surface portions of the anvil with an angle relative to said flat surface portion which is sufficient to provide a uniform downward flow of the metal of said sheet along the angled surface portions as the sheet is contacted by the scoring tool in minimizing disruption of the enamel coating of said sheet.

4,122,792

AERODYNAMIC DEVICE, PARTICULARLY FOR SAILS

John S. Rhoades, P.O. Box 197, Exton, Pa. 19341, and Patricia G. Rhoades, 38 Elm St., Marblehead, Mass. 01945

Filed Sep. 2, 1977, Ser. No. 830,329
Int. Cl.[2] B63H *9/04*
U.S. Cl. 114—103 **11 Claims**



7. In combination with a sail, an aerodynamic device for increased utilization of airflow across said sail, said device comprising a plurality of rearwardly extending, vertical fins disposed in a substantially horizontal row between the luff and the leech in substantially parallel relationship with a foot of said sail at an area of maximum air activity, the height of said row of fins extending a distance that is substantially less than the distance between the head and foot of said sail, each of said fins extending outwardly from said sail, one of said fins adjacent said luff and another one of said fins adjacent said leech, the distance between said one fin and said luff being less than the distance between said other fin and said leech, said fins operative to reach the free air layer beyond the zero activity and turbulent air layers flowing across said sail.

4,122,793

MAINSAIL AND/OR MIZZENSAIL FURLING DEVICE

Harold A. Molz, 17 Revell St., Annapolis, Md. 21401

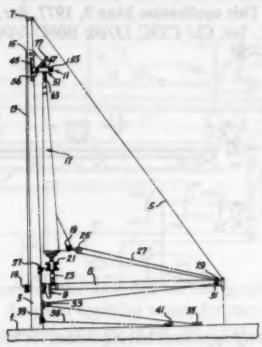
Filed Nov. 28, 1977, Ser. No. 855,195
Int. Cl.[2] B63H *9/10*
U.S. Cl. 114—106 **10 Claims**

1. A mainsail furling device for use on a sailboat having a mast, a halyard extending up the mast toward a masthead and then extending downwardly therefrom, the mast having a boom connected thereto and being mounted on the device of the sailboat, and the sailboat having a bow and a stern, the device comprising:

a. a lower swivel means mounted on the sailboat adjacent the base of the mast;

b. a hoistable upper masthead holding means slidably engaging the mast adjacent the masthead and movable relative thereto, said upper masthead holding means including:

1. means for movably engaging the mast,
2. a swivel,
3. means cooperating with the mast engaging means for maintaining said swivel a distance in the direction of the



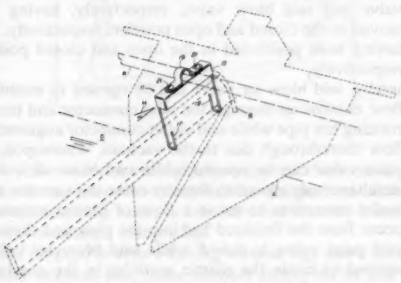
stern from the mast and substantially parallel to the mast,
4. means for connecting said holding means to the halyard,
5. means for connecting said swivel to the mainsail.

4,122,794

LIGHTWEIGHT ANCHOR RAIL MOUNT

Alfred P. Rossini, 6 Belmore Rd., Framingham, Mass. 01701

Filed Dec. 1, 1976, Ser. No. 746,098
Int. Cl.[2] B63B *21/22*
U.S. Cl. 114—210 **4 Claims**



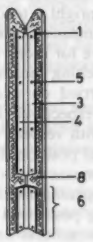
1. A lightweight anchor rail mount comprising:
(a) a base,
(b) a pair of hooks rigidly secured to the base, and
(c) means for securing the base to a rail
(d) said hooks being J shaped and disposed in parallel planes, spaced apart and aligned with each other, the hook portions of the two hooks defining a slot for receiving and holding a lightweight anchor, the legs of the two hooks being reversed relative to each other, the hooks extending downward from the base and being welded thereto, the base being in the shape of a rectangular open-bottomed box.

4,122,795

ELASTIC STREET DELINEATOR

Erich Döring, Langer Weg 3, 8052 Moosburg, Fed. Rep. of Germany

Filed Oct. 15, 1976, Ser. No. 733,004
Claims priority, application Fed. Rep. of Germany, Oct. 16, 1975, 2546427
Int. Cl.[2] E01F *9/04*
U.S. Cl. 116—63 R **4 Claims**



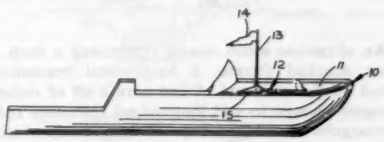
1. A street delineator comprising a pair of generally oppositely arranged, elongated rubber sheets which are connected to a support structure adapted to be anchored to the ground, said sheets comprising tread surface portions of used automobile tires from which the sidewalls have been removed, said support structure disposed between said sheets and including an upright reinforcing portion extending upwardly along said sheets from the lower ends thereof and in reinforcing contact therewith, said reinforcing portion of the support portion being approximately V-shaped in cross-section to define a V-shaped support portion, the two rubber sheets being fixed to legs of said V-shaped support portion so as to be disposed at an angle relative to each other, said support structure being completely interrupted above the lower end of the delineator at a location intermediate the ends of the sheets to define at least one rated bend point so that the delineator is continuously urged upright by the rubber sheets.

4,122,796

ADJUSTABLE PENNANT WARNING OF DOWNED WATER SKIERS

Kurt T. Pressler, 9 Canyon View Dr., Orinda, Calif. 94563, and Scott Cattell, 5515 Rio Vida La., Sebastapol, Calif. 95472

Filed Mar. 11, 1977, Ser. No. 776,790
Int. Cl.[2] A63C *15/00*; G08B *5/14*
U.S. Cl. 116—132 R **2 Claims**



1. Warning pennant and support means for warning other boats or the like of an immobile water skier downed in water adjacent to a tow boat, comprising:
(a) a mast having a first end fixedly attached to said warning pennant and a second end opposite to said pennant;
(b) a base fixedly attached to a deck or the like of said tow boat but carrying cooperative rotatable cup means for receiving said second end of said mast, and disconnectably swivelable along an arc defined by:
(i) a horizontal flat stowage position wherein said mast and said pennant attached thereto are positioned adjacent to said deck or the like, substantially parallel therewith; and
(ii) an upright signal position in which said first end of said

mast attached thereto is a maximum distance above said deck or the like whereby said pennant is afforded maximum viewability for warning other boats of said downed skier;

(c) said cooperative rotatable cup means also including a cylindrical swivel containing a slot at said one end to receive said mast and fitted with a bore at its opposite end defining an axis substantially normal to that of said slot; pin means fixedly positioned within said bore of said swivel but having ends extending there-beyond and rotatably attaching to upright extending walls of said base; and associated locking means located intermediate of said pin means and said bore for receiving said mast;

(d) said associated locking means includes first and second element means carried on said base and said rotatable cylindrical swivel respectively for releasably securing said base and swivel with respect to each other in stowage position (i) or signal position (ii);

(e) said first element means of said associated locking means includes a central opening within said cylindrical swivel, a compression spring positioned within said opening, and tensionable metallic spheres carried at opposite ends of said spring in sliding contact with upright walls of said base, said second element means including spaced recess means provided in upright walls of said base.

4,122,797

ULTRASONIC SOUND SOURCE AND METHOD FOR MANUFACTURING RECTANGULAR DIAPHRAGM OF ULTRASONIC SOUND SOURCE

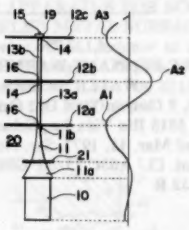
Masatada Kawamura, Hoya, and Hiroyuki Yamane, Yono, both of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Okayama, Japan

Filed Oct. 1, 1976, Ser. No. 728,883

Claims priority, application Japan, Mar. 25, 1976, 51/33236; Mar. 25, 1976, 51/33237; Sep. 10, 1976, 51/122357[U]

Int. Cl.² B06B *1/02, 1/10*

U.S. Cl. 116—137 A **10 Claims**



2. An ultrasonic sound source comprising a horn and a vibrator attached thereto, a longitudinal resonance rod mounted on the small end of said horn a set of rectangular diaphragms secured to said longitudinal resonance rod with the rectangular diaphragms disposed transversely of said rod, said rectangular diaphragms being fixed at positions of antinodes of the vibration amplitude of said horn and longitudinal resonance rod and spaced at multiples of ½ wavelengths of the frequency of vibration of said horn, each diaphragm having a dimension of length l_L in the direction perpendicular to the nodal lines of vibration in the stripes mode and a width l_W in the direction of the nodal lines according to the equations

$$l_L = (N - \tfrac{1}{2}) \cdot d$$

$$l_W = N' \cdot d$$

wherein N is the number of even-numbered nodal lines of the vibration in the stripes mode; N' is an odd number smaller than N, and d is the distance between the nodal lines of the vibration in the stripes mode.

4,122,798

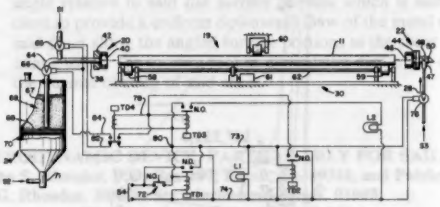
APPARATUS FOR COATING THE INTERIOR OF TUBULAR GOODS

Jack E. Gibson, 4905 Pepperidge Pl., Odessa, Tex. 79761

Continuation of Ser. No. 704,965, Jul. 13, 1976, Pat. No. 4,089,998. This application May 9, 1977, Ser. No. 795,127

Int. Cl.² C23C *13/08;* B05C *7/04*

U.S. Cl. 118—50 **9 Claims**



6. In a coating apparatus having means for heating a pipe and rotating the heated pipe, and a fluidized bed apparatus having a chamber therein for containing a fluidized bed of plastic particles, a source of high pressure blow air, a vacuum source, and inlet connector for being removably attached to one end of the pipe, and an outlet connector for being removably attached to the other end of the pipe, the improvement comprising:

means, including a paint valve, connector to control flow from said chamber to said inlet connector; means, including a blow air valve, connected to control the flow of said source of high pressure blow air to said inlet connector;

means for opening said paint valve while simultaneously closing said blow air valve, and vice versa;

means flow connecting said outlet connector to said vacuum source;

indicator means connected to provide a signal which indicates that said paint valve has closed after a charge from said fluidized bed has been transferred into said inlet connector so that said outlet connector can be removed from the other end of the pipe; said indicator means being connected to provide said signal in response to said paint valve and said blow valve, respectively, having been moved to the closed and open position, respectively, after having been positioned in the open and closed position, respectively;

whereby, said blow air valve can be opened to establish a flow of blow air through the inlet connector and into the rotating hot pipe while said outlet connector augments the flow therethrough due to the vacuum, whereupon, said paint valve can be opened while said blow air valve is simultaneously closed to thereby cause the vacuum at the outlet connector to cause a flow of plastic material to occur from the fluidized bed into the pipe, and thereafter said paint valve is closed while said blow air valve is opened to cause the plastic particles in the conduit to continue to flow into the pipe; and said outlet connector can be removed from the outlet end of the pipe prior to the charge reaching the outlet connector.

4,122,799

PAINTING DEVICE

Antonio Ortega, 2608 SW 8th St., Apt. #11, Miami, Fla. 33135

Filed Feb. 25, 1977, Ser. No. 771,940

Int. Cl.² B05C *1/00*

U.S. Cl. 118—207 **2 Claims**

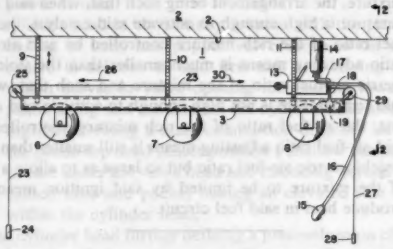
1. A painting device for painting a strip of wall adjacent the ceiling of a room, said painting device comprising

expandable substantially linear guide means;

suction cup means affixed to the guide means for releasably affixing the guide means to a wall at a desired space below a ceiling meeting the wall;

paint applying means including a roller, said paint applying

means being movably mounted on the guide means for movement along the length of said guide means with the roller in abutment with the wall; and



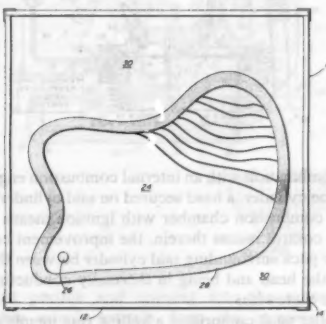
pulley and cord means mounted on the guide means and coupled to the paint applying means for moving the paint applying means as desired along the length of the guide means.

4,122,800

SELF-CONTAINED VIVARIUM HABITAT

Edward M. Mangarell, 0 - 92 W. Amsterdam Ave., Fair Lawn, N.J. 07410

Filed Jul. 5, 1977, Ser. No. 813,032
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—5 **1 Claim**



1. A self-contained, ecologically-balanced, thermostatically-regulated amphibian vivarium habitat designed to allow the contained amphibia ready access between discrete water and earth environments, comprising:

a base support structure having vertical legs and a horizontally oriented base frame member supported by said legs;

an upper habitat housing having a substantially rectangular shape, having transparent vertically oriented, abutting side walls, the bases of said side walls being recessed in said base frame member;

a plurality of right angle corner brackets connecting adjacent side walls;

a rectangular, transparent top cover situated removably on top of said transparent side walls, coplanar with said base frame member, displaced forward of the rear side of said upper habitat structure;

said base support structure and said upper habitat housing forming an integral portable, self-contained habitat which can be moved to any suitable location;

a rectangular shaped lighting apparatus removably mounted along the rear side walls of said upper habitat housing and displaced to the rear of said top cover;

said lighting apparatus having both a flourescent white light and an infrared dark light running parallel to said rear side wall;

a thermometer-thermostat means mounted within the upper habitat housing to regulate and display the ambient temperature within said habitat to provide a balanced ecological environment;

an integral molded, contoured foundation member for said upper habitat housing, mounting on said base support structure and within said transparent walls;

said contoured foundation member having a centrally oriented, irregularly shaped, depressed aquatic region to serve as the water area of said habitat;

said aquatic region being irregularly contoured and graduated in depth;

a barrier area contiguous to and surrounding the perimeter of said aquatic region, serving to separate the aquatic region from the plants contained within said vivarium habitat;

a terrestrial region contiguous to and surrounding said barrier area providing a raised area of level dry earth for planting extending to the transparent side walls of said upper habitat housing;

said contiguous and discrete terrestrial, barrier and aquatic regions permitting amphibia ease of access to the regions of said vivarium habitat;

a drain plug opening situated at the lowest point in said depressed aquatic region;

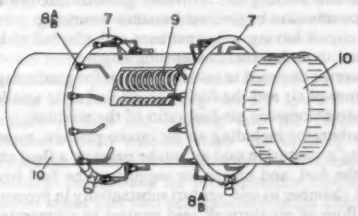
a drain plug snugly fitted into said drain plug opening and accessible from beneath said base frame member for draining and cleaning purposes.

4,122,801

WASTE ENERGY HOT WATER HEATER

Daniel E. Burns, 28 N. Main St., Canandaigua, N.Y. 14424

Filed Apr. 25, 1977, Ser. No. 785,654
Int. Cl.[2] F22D *1/02*; F22B *31/02*
U.S. Cl. 122—20 B **2 Claims**



1. An accessory water heater for use in an exhaust flue of a heating device;

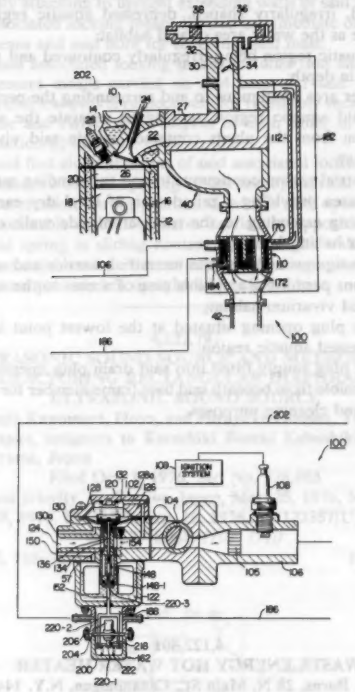
said accessory water comprising an inlet conduit externally around the exhaust flue, an outlet conduit disposed externally around the exhaust flue and spaced along the length of the flue from said inlet conduit, a plurality of small coils positioned around the inner periphery of the exhaust flue, each of said coils having inlet means and outlet means extending through the exhaust flue, means connecting said inlet means of each coil to said inlet conduit and means connecting said outlet means of each coil to said outlet conduit.

4,122,802

FUEL REFORMING SYSTEM

Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 22, 1976, Ser. No. 725,521
Claims priority, application Japan, Sep. 25, 1975, 50-116203
Int. Cl.[2] F02B *43/08*; F02M *1/10*
U.S. Cl. 123—3 **11 Claims**



1. A fuel reforming system for converting a mixture of air and a fuel into a reformed gaseous mixture rich with free hydrogen and feeding the reformed gaseous mixture into an internal combustion engine, said system comrising:

a fuel circuit having a downstream end adapted to be connected to an internal combustion engine;

a carburetor disposed in said fuel circuit for producing a rich mixture of air and the fuel at an air-fuel ratio smaller than the stoichiometric air-fuel ratio of the mixture;

said carburetor including an air intake passage, means providing a venturi in said air intake passage, a float chamber for the fuel, and means for supplying the fuel from said float chamber to said venturi substantially in proportion to the flow of air through said venturi to cooperate therewith to produce the rich air-fuel mixture;

ignition means disposed in said fuel circuit downstream of said carburetor and being adapted to be operated, when required, to ignite and burn the air-fuel mixture in said circuit;

a reactor vessel disposed in said fuel circuit downstream of said ignition means and containing a catalyst for facilitating a catalytic reformation of said rich air-fuel mixture into said reformed gaseous mixture, said catalyst being disposed in heat exchange relationship with the engine exhaust gases;

said fuel supplying means comprising a fuel passage extending between said float chamber and said venturi;

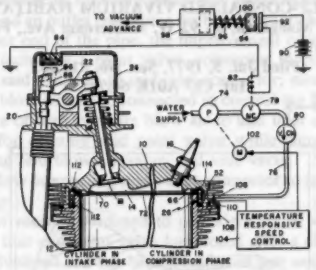
air-fuel ratio adjusting means mounted on said carburetor and being operative in response to the variation in the temperature in one of said engine and said reactor vessel to vary the cross-sectional area of said fuel passage for thereby controlling the air-fuel ratio of said rich air-fuel mixture, the arrangement being such that, when said temperature is high enough to activate said catalyst, the air-fuel ratio of the rich mixture controlled by said air-fuel ratio adjusting means is much smaller than the stoichiometric air-fuel ratio of the mixture and such that, when said temperature is not high enough to activate said catalyst, the air-fuel ratio of the rich mixture controlled by said air-fuel ratio adjusting means is still smaller than said stoichiometric air-fuel ratio but so large as to allow a part of the mixture to be ignited by said ignition means to produce heat in said fuel circuit.

4,122,803

COMBINED INTERNAL COMBUSTION AND STEAM ENGINE

Hugo S. Miller, 4133 Caflur Ave., San Diego, Calif. 92117

Filed Oct. 14, 1977, Ser. No. 842,065
Int. Cl.[2] F02D *21/06*
U.S. Cl. 123—25 P **19 Claims**



1. In combination with an internal combustion engine having at least one cylinder, a head secured on said cylinder, said head having a combustion chamber with ignition means and timed fuel inlet control means therein, the inprovement comprising:

a boiler pack surrounding said cylinder between the cylinder and the head and being in thermally conducting engagement therewith;

said boiler pack comprising a hollow ring member having at least one water conducting chamber therein, with a water inlet having means for connection to a source of pressurized water;

said ring member having a substantially circumferential steam injection slot opening into said cylinder;

a control valve connected between said water inlet and said source of pressurized water;

and timing means actuated by said timed fuel inlet control means to open said control valve and release water into said injection slot when the cylinder is in the compression phase of the engine cycle.

4,122,804

DIESEL ENGINE COMBUSTION CHAMBERS

William L. Kingsbury, Lansing; Kelly W. Thurston, Okemos, and Harry L. Chapman, Lansing, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 711,064, Aug. 2, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,417
Int. Cl.[2] F02B *3/00, 23/00*
U.S. Cl. 123—32 ST **4 Claims**

1. A precombustion chamber type diesel engine of the type wherein combustion gases from a prechamber are discharged into the space between a piston and a cylinder heat at substan-

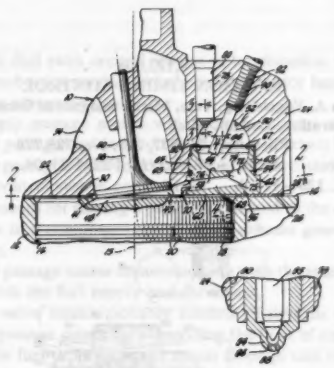
tially the top dead center position of the piston including the combination of:

a piston reciprocable on an axis between top and bottom dead center positions through successive compression and power strokes,

a cylinder head in cooperating relation with the piston and having at least one poppet valve disposed on an axis canted in relation to said first axis and having a head which moves in valve opening movements toward the piston along said canted axis, the cylinder head and piston together defining a main combustion chamber having at the piston top dead center position a shallow pancake-like pocket under the valve head and extending normal to said canted axis, said pocket having an elevated side largely within the cylinder head,

the cylinder head further defining a precombustion chamber having a discharge passage with a generally straight portion in substantial edge alignment with said pocket and having extent in the direction of the canted axis approximately equal to the extent of said pocket said passage being registered with and opening into the elevated side of said pocket so as to direct gaseous discharge into said pocket from the edge thereof at its elevated portion;

said discharge passage at its end distal from said pocket having a portion extending sharply upward from said



straight portion and opening into the precombustion chamber which extends from the opening primarily toward the canted axis so as to form a wall bounded by the discharge passage and the precombustion chamber, and

means to inject fuel into said precombustion chamber in a direction generally parallel to said first axis and toward said wall, said fuel injection means including a spray tip having at least one pair of angularly disposed orifices arranged on axes lying in a plane generally parallel to said first axis, said nozzle orifices being oriented to direct fuel in a broad path downwardly toward said wall so that the air discharge into the precombustion chamber during each compression stroke generates a swirl initially curving inwardly towards said first axis and then traveling downwardly generally parallel to said axis and towards said wall and the injected fuel travels with said swirling airflow into a temporarily locally rich mixture space above the wall wherein combustion occurs under conditions relatively unfavorable to NO_x production,

the precombustion chamber being about the size of the main chamber and the discharge passage being arranged such that gases discharging from the precombustion chamber fan out against the valve head and cylinder head and the piston so that the piston thermal load is comparable to the thermal load of the valve and cylinder head in the main chamber.

4,122,805

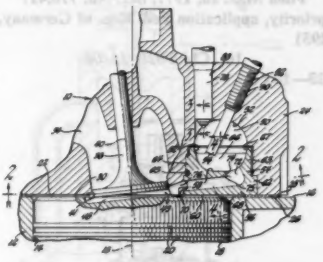
DIESEL ENGINE COMBUSTION CHAMBERS

William L. Kingsbury, Lansing, and Kelly W. Thurston, Okemos, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 710,924, Aug. 2, 1976, abandoned. This application Jun. 24, 1977, Ser. No. 809,418

Int. Cl.[2] F02B *3/00, 23/00*

U.S. Cl. 123—32 ST **15 Claims**



1. A precombustion chamber diesel engine of the type wherein combustion gases from a prechamber are discharged into the space between a piston and a cylinder head at substantially the top dead center position of the piston including the combination of:

a piston reciprocable on an axis between top and bottom dead center positions through successive compression and power strokes,

a cylinder head in cooperating relation with the piston and having at least one poppet valve disposed on an axis canted in relation to said first axis and having a head which moves in valve opening movements toward the piston along said canted axis, the cylinder head and piston together defining a main combustion chamber having at the piston top dead center position a shallow pancake-like pocket under the valve head and extending normal to said canted axis, said pocket having an elevated side largely within the cylinder head,

the cylinder head further defining a precombustion chamber having a discharge passage with a generally straight portion in substantial edge alignment with said pocket and having extent in the direction of the canted axis approximately equal to the extent of said pocket, said passage being registered with and opening into the elevated side of said pocket so as to direct gaseous discharge into said pocket from the edge thereof at its elevated portion,

said discharge passage at its end distal from said pocket having a portion extending sharply upward from said straight portion and opening into the precombustion chamber which extends from the opening primarily toward the canted axis so as to form a wall bounded by the discharge passage and the precombustion chamber, and

means to inject fuel into said precombustion chamber in a direction generally parallel to said first axis and toward said wall so that the air discharge into the precombustion chamber during each compression stroke generates a swirl initially curving inwardly towards said first axis and then traveling downwardly generally parallel to said axis and towards said wall and the injected fuel travels with said swirling airflow into a temporarily locally rich mixture space above the wall wherein combustion occurs under conditions relatively unfavorable to NO_x production,

the precombustion chamber being about the size of the main chamber and the discharge passage being arranged such that gases discharging from the precombustion chamber fan out against the valve head and cylinder head and the piston so that the piston thermal load is comparable to the

thermal load of the valve and cylinder head in the main chamber.

4,122,806

VALVE FOR ADDING EXTRA AIR IN AN INTERNAL COMBUSTION ENGINE

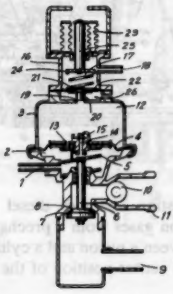
Wilfried Bockelmann, Kaarst, and Rainer Steinbrink, Wuppertal, both of Germany, assignors to Deutsche Vergaser GmbH & Co. Kg, Neuss, Germany

Filed Mar. 10, 1977, Ser. No. 776,417

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612951

Int. Cl.[2] F02D *11/08*

U.S. Cl. 123—103 R 4 Claims



1. A valve arrangement for adding air to the intake line of an internal combustion engine, particularly Ottocycle engines during the deceleration phase, comprising: a first diagram controlled by via an intake pipe intake pipe pressure; dosing means 3 holding said first diaphragm, said first diaphragm dividing said dosing means into first and second chambers comprising, respectively, a control pressure chamber connected via a line with the intake pipe and a reference pressure chamber; first spring means acting against said first diaphragm; a valve and a rod actuated by said first diaphragm; a calibration and a check valve connecting said first and second chambers; second dosing means comprising second spring means acting against a second diaphragm dividing said second dosing means into third and fourth chambers; the third chamber being connected via a second line with the intake pipe; said second diaphragm being controlled by intake pipe pressure; the fourth chamber being open to atmosphere and connectable via bore means with said reference pressure chamber; said second diaphragm actuating a valve disc against the force of said second spring means for venting said reference pressure chamber.

4,122,807

IGNITION SPARK TIMING CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Akio Hosaka, Yokohama, and Satoshi Sakamoto, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 23, 1976, Ser. No. 744,261

Claims priority, application Japan, Dec. 5, 1975, 50/162926[U]

Int. Cl.[2] F02P *5/04*

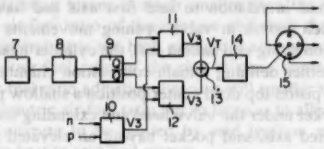
U.S. Cl. 123—117 R 5 Claims

1. An ignition spark timing control system for an internal combustion engine, said ignition timing control system including an advance angle control unit for generating an output signal in response to the magnitude of the vacuum in the intake manifold of the engine and to the rotational speed of the crank shaft of the engine, and an ignition unit connected to the distributor of the engine for developing a high DC voltage in response to the output of said advance angle control unit, wherein the improvement comprises;

(1) a reference angle signal generator for generating reference angle signals corresponding to respective reference angles of each cylinder of the engine;

(2) a divider for dividing said reference angle signals to provide divided signals;

(3) at least two voltage-advance angle converters sequentially operated in an alternative manner in response to said



divided signals in dependence on the output signal of said advance angle control unit; and

(4) an adder connected to said voltage-advance angle converters to develope a control signal by adding the outputs of said voltage-advance angle converters, said control signal being supplied to said ignition unit for controlling the ignition timing.

4,122,808

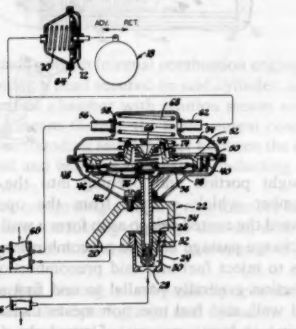
IGNITION TIMING CONTROL

William A. Vogelsberg, Yale, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 8, 1977, Ser. No. 785,778

Int. Cl.[2] F02P *5/10*; F02M *25/06*

U.S. Cl. 123—117 A 2 Claims



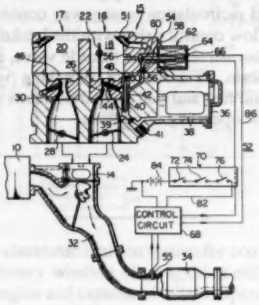
1. An ignition timing control assembly for an internal combustion engine having an exhaust passage and means for effecting ignition, said ignition timing control assembly comprising means forming a pressure region and a motor for adjusting said ignition effecting means to advance the timing of ignition in inverse relation to the pressure in said region, said region having an orifice for sensing a subatmospheric pressure and a bleed for sensing atmospheric pressure, a valve member for varying air flow through said bleed to control the pressure in said region, and means responsive to variations in pressure in said exhaust passage for positioning said valve member whereby said valve member reduces flow through said bleed upon an increase in the exhaust passage pressure to reduce the control pressure and cause said motor to advance the timing of ignition and increases flow through said bleed upon a decrease in the exhaust passage pressure to increase the control pressure and cause said motor to retard the timing of ignition.

4,122,809

AIR-FUEL RATIO CONTROL SYSTEM

Yoshio Iwasa, Nagareyama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 27, 1976, Ser. No. 736,231
Claims priority, application Japan, Oct. 28, 1975, 50-129652
Int. Cl.[2] F02B *33/00*; F02M *7/00*; F02B *75/10*
U.S. Cl. 123—119 EC 10 Claims



1. An air-fuel ratio control system in combination with an internal combustion engine including a carburetor having:

an intake passageway and

fuel supply passage means which communicates with the intake passageway and from which fuel is drawn into the intake passageway to form an air-fuel mixture; said air-fuel ratio control system comprising:

sensing means for sensing a parameter related to the concentration of a component contained in exhaust gases of the engine,

air bleed passage means communicating with the atmosphere and with the fuel supply passage means,

control valve means movably located relative to said air bleed passage means for controlling the flow of air drawn into the fuel supply passage means through said air bleed passage means,

solenoid means for operating said control valve means,

control circuit means electrically connected to said sensing means for generating a control signal in accordance with the value of said parameter sensed by said sensing means, siad solenoid means being electrically connected to said control circuit means for causing, in response to said control signal, said control valve means to move into a position in which said control valve means varies the flow of said air thereby varying the flow of fuel drawn from the fuel supply passage means into the intake passageway and to thereby control the air-fuel ratio of an air-fuel mixture formed by the carburetor to a desired air-fuel ratio,

an electrical circuit means connecting said control circuit to said solenoid means,

switch means, responsive to the temperature of the engine and located in said electrical circuit, for closing said electrical circuit in response to temperatures of the engine which are above a predetermined value and for opening said electrical circuit in response to temperatures of the engine which are below said predetermined value, and

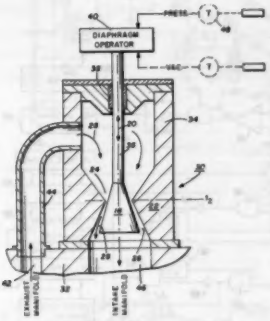
means for causing, in response to an open condition of said electric circuit, said control valve means to move into a position in which said control valve means reduces the flow of said air thereby to increase the flow of said fuel and to have the carburetor form an enriched air-fuel mixture.

4,122,810

AUTOMOTIVE EXHAUST GAS RECIRCULATION VALVE

Lester P. Berriman, Irvine, Calif., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 7, 1977, Ser. No. 813,585
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A 11 Claims



1. In an exhaust gas recirculating valve adapted for use with an internal combustion engine comprising a housing internally containing a convergent-divergent flow path between a first opening adapted to receive exhaust gas from the exhaust manifold and a second opening adapted to discharge gas received from said first opening to the intake manifold, a movable pintle cooperating in said flow path to define a nozzle therewith for effecting sonic gas flow through the nozzle throat and operator means effective to axially displace said pintle toward and away from the nozzle throat in response to a predetermined engine variable, the improvement in which the direction of pintle movement by said operator toward restricting the flow area through said nozzle throat is counter to the direction of incoming flow adapted to be received at said first opening.

4,122,811

DIGITAL CLOSED LOOP FUEL CONTROL SYSTEM

Lauren L. Bowler, Bloomfield Hills, and John O. Rice, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 25, 1977, Ser. No. 818,428
Int. Cl.[2] F02B *33/00*
U.S. Cl. 123—119 EC 3 Claims

1. A closed loop system for controlling the ratio of the air/fuel mixture supplied to an internal combustion engine, the system comprising:

means responsive to the content of the exhaust gas output of the internal combustion engine effective to generate an air/fuel ratio signal changing abruptly between first and second voltage values in accord with the relationship of the air/fuel ratio relative to a stoichiometric ratio;

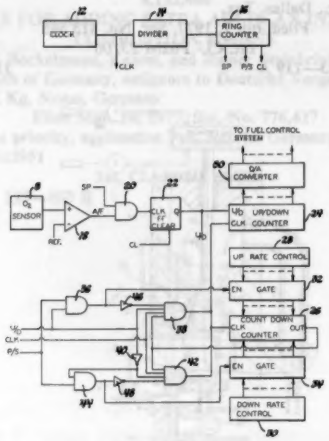
an up/down digital counter having selectable up and down counting modes;

means effective to generate clock pulses at a substantially constant frequency;

means responsive to the voltage values of the air/fuel ratio signal effective at sampling intervals having a predetermined time spacing to (1) enable the up/down counter to count a predetermined first number of clock pulses in one of its counting modes and maintain the net count to the next sampling interval when the air/fuel ratio signal is at one of its voltage values and (2) enable the up/down counter to count a predetermined second number of clock pulses in the other one of its counting modes and maintain the net count to the next sampling interval when the

air/fuel ratio signal is at the other one of its voltage values; and

means effective to vary the air/fuel ratio in accord with the



net count in the up/down counter, the air/fuel ratio being controlled by the last mentioned means to a value offset from the stoichiometric value by an amount determined by the first and second numbers of clock pulses.

4,122,812

EXHAUST GAS RECIRCULATION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

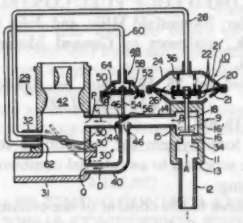
Yuuichi Takano, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 5, 1977, Ser. No. 756,858

Claims priority, application Japan, Oct. 19, 1976, 51-139573[U]

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**



1. An exhaust gas recirculation apparatus for an internal combustion engine, comprising:

a vacuum operated flow control valve having an inlet and an outlet, which valve is adapted for controlling the amount of exhaust gas to be recirculated from said inlet to said outlet in accordance with a vacuum level formed in the intake system of the engine;

a first pipe means adapted for connecting said inlet of the flow control valve with the exhaust system of the engine in order to introduce the exhaust gas in the exhaust gas pipe into said inlet;

second pipe means, one end of which is connected to the outlet of the flow control valve;

third pipe means adapted for connection of another end of the second pipe means with the intake system at the location situated upstream of the throttle valve;

a fourth pipe means adapted for connection of said other end of the second pipe means with the intake system at the location situated downstream of the throttle valve;

a switching valve member arranged adjacent to said other end of the third pipe means, which member is capable of being moved between a first position in which said second pipe means communicates with said third pipe means in order to form said first recirculation passageway connecting the outlet of the flow control valve with the intake system at the location upstream of the throttle valve, and a second position in which said second pipe means communicates with said fourth pipe means in order to form said second recirculation passageway connecting the outlet of the flow control valve with the intake system at the location downstream of the throttle valve, and;

operating means to move said switching valve member between said first and said second positions in accordance with engine operating conditions.

4,122,813

INJECTION TIMING ADJUSTMENT APPARATUS

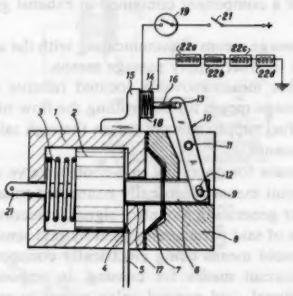
Konrad Barnert, and Günter Stein, both of Wolfsburg, Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 13, 1976, Ser. No. 686,010

Claims priority, application Fed. Rep. of Germany, May 16, 1975, 2521827

Int. Cl.² F02D *1/16*

U.S. Cl. 123—139 ST **10 Claims**



1. Apparatus for adjusting the injection timing of an internal combustion engine fuel injection pump in response to supplied pressure proportional to the speed of said engine, comprising:

a cylinder;

a piston, movable within said cylinder in response to said supplied pressure, for advancing said injection timing in response to said supplied pressure;

a spring urging said piston against said pressure;

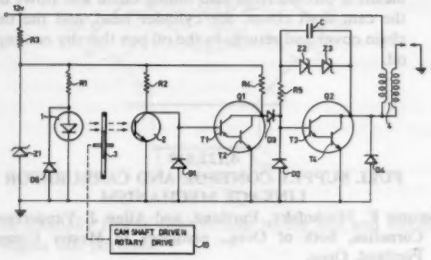
engaging means, movable between a first and a second position, for engaging said piston in said first position to move said piston against said spring to advance said timing independent of said supplied pressure and for disengaging said piston in said second position to permit said piston to operate freely in response to said supplied pressure;

and means for moving said engaging means to said first position during cold starting of said engine, and moving said engaging means to said second position during normal engine operation.

4,122,814
OPTO-ELECTRONIC IGNITION SYSTEMS FOR INTERNAL COMBUSTION ENGINES

Eric H. Ford, 17 Kensington Gate, London, W.8., England

Continuation-in-part of Ser. No. 655,138, Feb. 3, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,744
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 E 11 Claims



1. An opto-electronic ignition system for controlling switching of the primary winding of an ignition coil of an internal combustion engine and capable of reliable operation at temperatures above about 125° C, said system comprising a source of radiation; a photo-transistor sensitive to radiation which will switch on or conduct when exposed to the radiation and switch off when the radiation is cut off; means disposed between said source and said photo-transistor for intermittently blocking radiation from said source in timed relation to the engine revolutions so as to control the periods during which radiation is received by said photo-transistor; and a switching circuit for controlling switching of the ingition coil responsive to the output of said photo-transistor; said switching circuit comprising a plurality of pairs of transistors the components of each pair being connected in a Darlington configuration and means for connecting said pairs of transistors to each other between said photo-transistor and the ignition coil such that each Darlington pair switches in inverse relationship to at least one other Darlington pair and a first Darlington pair switches in inverse relationship to said photo-transistor, so as to cause fast switching of the primary winding of the ignition coil thereby inducing a spark voltage in the second winding of the coil.

4,122,815
NON-DC IGNITION SYSTEM WITH VARIABLE IGNITION TIMING

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Mar. 31, 1977, Ser. No. 783,388
Int. Cl.[2] F02P *3/02*
U.S. Cl. 123—148 E 25 Claims

1. A method for fuel ignition in an engine by electrically energizing any of a plural number of igniters therein, comprising in combination the steps of:

(a) computing the individual firing period for each of the igniters, one igniter firing period at a time;

(b) compensating for the reactive component difference between the output of a non-DC power source and the input of an ignition transformer; and

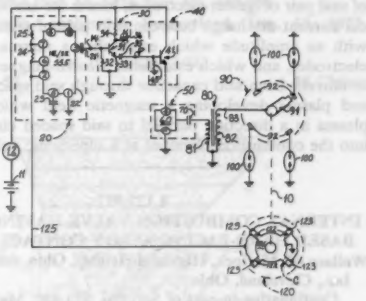
(c) energizing each of the igniters with the non-DC power provided to said transformer during each of their respectively computed firing periods.

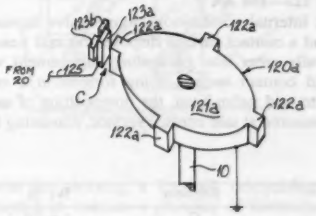
16. An ignition system which during its operative mode provides variable ignition timing periods to an engine, said system utilizing an ignition transformer, comprising the combination:

an angularly modulated waveform generator;

first means, integral with the waveform generator and driven by the engine during said operative mode, for providing wave trains of varying time durations, which time durations are inversely proportional to the rotational speed of the engine;

an electronic control circuit electrically coupled to the generator;





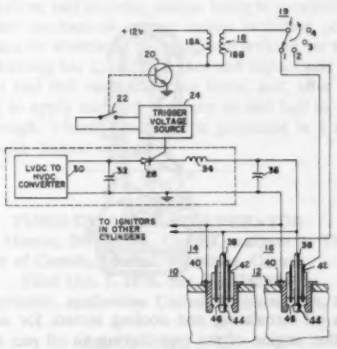
a non-DC power source electrically coupled to the transformer; and

a capacitor in circuit with the power source and the transformer.

4,122,816
PLASMA IGNITER FOR INTERNAL COMBUSTION ENGINE

Dennis J. Fitzgerald, Pasadena, and Robert R. Breshears, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 1, 1976, Ser. No. 672,636
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—148 DC 8 Claims



1. A system for igniting the air/fuel mixture introduced into each of the chambers of an internal combustion engine comprising a pair of substantially parallel electrodes spaced with a gap of substantial depth within each of said chambers, said gap

being open to receive an air/fuel mixture, an intermediate spark electrode between said pair of spaced electrodes, a high voltage, high current storage capacitor voltage means for storing a high electrical charge in said capacitor, means for applying a spark voltage between said spark electrode and one of said pair of igniter electrodes, means for enabling an electrical current discharge between said pair of spaced electrodes with an amplitude which establishes a plasma between the electrodes, and which establishes electro-magnetic forces due to current from said capacitor through said spaced electrodes and plasma developing a magnetic field which drives the plasma in a direction parallel to said spaced electrodes deep into the combustion chamber at a supersonic velocity.

4,122,817

INTERNAL COMBUSTION VALVE HAVING AN IRON BASED HARD-FACING ALLOY CONTACT SURFACE

Wallace M. Matlock, Highland Heights, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 573,430, May 1, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,407

Int. Cl.[2] F01L *3/04*; C22C *38/44*; B32B *15/18*

U.S. Cl. 123—188 AA **6 Claims**

1. An internal combustion engine valve having a body, a head, and a contact surface disposed on said head adapted to periodically enter into gas-sealing engagement with a valve seat, said contact surface being formed in a metal deposit welded to said valve head, the composition of said metal deposit, measured at said contact surface, consisting essentially of

Element	Wt. %
C	1.4–2.0
Mo	4.0–6.0
Ni	8–13
Cr	20–26
Si	0.1–1.0
Mn	0–3.0
Fe	balance

4,122,818

OIL CIRCULATING AND COOLING SYSTEM

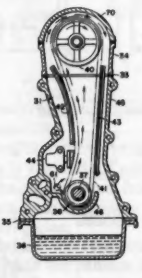
Kyo Hattori, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 12, 1976, Ser. No. 685,497

Claims priority, application Japan, Nov. 11, 1975, 50-136063; Dec. 22, 1975, 50-157454

Int. Cl.[2] F01M *1/00*

U.S. Cl. 123—196 AB **7 Claims**



1. An oil circulating and cooling system for an internal combustion engine of the type having an oil pan and an oil distribution system comprising:

an oil pump to pump oil under pressure throughout the oil distribution system of said internal combustion engine;

a valve means coupled to the output of said oil pump for diverting a portion of said oil from said oil pump when the oil pressure from said oil pump is some predetermined value;

a half arc chain seat for a crank timing gear to hold said diverted oil from said valve means, said half arc seat and said valve means arranged and configured such that said diverted oil is applied directly to the crank timing gear to said half arc seat, and to said timing chain whereby as the timing chain revolves the diverted oil from said valve means is thrown from said timing chain and flows down the cam shaft cover, the cylinder head, and the timing chain cover and returns to the oil pan thereby cooling the oil.

4,122,819

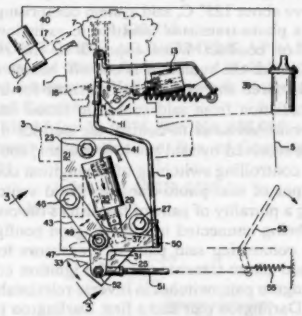
FUEL SUPPLY CONTROL AND CARBURETOR LINKAGE MECHANISM

Jerome F. Moshofsky, Portland, and Allan J. Vanderzanden, Cornelius, both of Oreg., assignors to Hyster Company, Portland, Oreg.

Filed Sep. 22, 1976, Ser. No. 725,514

Int. Cl.[2] F02B *77/08*

U.S. Cl. 123—198 D **8 Claims**



1. A fuel supply control system for an engine comprising a movable crank mounted on the engine for actuating fuel supply increasing means on the engine;

and means responsive to engine ignition for selectively relocating the pivot point of the crank so that actuation of the supply increasing means through the crank is prevented.

4,122,820

ENGINE COVER AND AIR CLEANER SUPPORT

John G. Ryberg, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 2, 1977, Ser. No. 802,612

Int. Cl.[2] F02B *75/22*, *77/00*

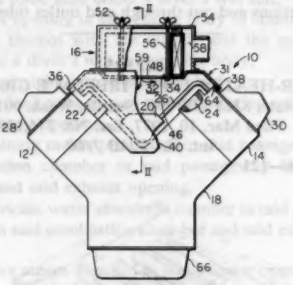
U.S. Cl. 123—198 E **8 Claims**

1. In an engine having first and second opposed end portions, and first and second spaced-apart side portions having a general "V" profile, the improvement comprising:

a cover having a first side portion sealably connected to the first engine side portion, a second side portion sealably connected to the second engine side portion, a first end portion sealably connected to the first engine end portion, a second end portion sealably connected to the second engine end portion, and a middle portion extending between the side and end portions of the cover;

a chamber defined by said engine and said cover and having an opening on the middle portion of the cover; and

an air cleaner mounted on the middle portion of the cover over the chamber opening and forming an air passageway



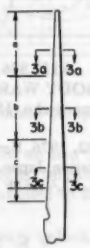
substantially free of obstructions to the first and second engine side portions.

4,122,821

ARCHERY BOW AND METHOD OF ADVANTAGEOUSLY ALTERING BOW CHARACTERISTICS

Anthony C. Mamo, 1515 E. Central Ave., Apt. 264B, Arlington Heights, Ill. 60005

Filed Dec. 30, 1976, Ser. No. 755,972
Int. Cl.² F41B 5/00
U.S. Cl. 124—23 R **5 Claims**



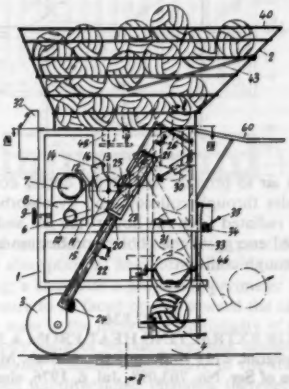
1. In an archery bow of the type having a longitudinally curved body member which includes a central grip portion with outwardly extending limbs, and a string member joining the outer ends of said outwardly extending limbs, the improvement which comprises a limb structure having cross-sectional configurations that are curved in its transverse planes which are substantially perpendicular to its longitudinal axis, said cross-sectional configurations having predetermined dimensions of thickness and predetermined dimensions of extent of curvature which progressively vary at different sections of the limb structure, such that with increasing draw distance in the archery bow, the radius of longitudinal curvature of the limb structure decreases while said cross-sectional configurations increase in radius of curvature progressively and at different rates at different sections of the limb structure.

4,122,822

SPRING TYPE APPARATUS FOR THE PROJECTING OF FOOTBALLS AND THE LIKE

Kurt Scheiwiller, 25 Wiesentalstrasse, 9242 Oberuzwil, Switzerland

Filed Dec. 13, 1976, Ser. No. 749,604
Claims priority, application Switzerland, Dec. 11, 1975, 16192/75
Int. Cl.² F41B 7/00
U.S. Cl. 124—54 **16 Claims**



1. Apparatus for shooting a football, comprising: a ball container adapted to contain a plurality of footballs, means defining a ball shooting station, transfer means for the transfer of balls one at a time from said container to said shooting station, striking means for striking a ball located at said shooting station, said striking means having ball engaging means that impacts against a ball to immediately propel a football through the air, adjustment means for adjusting the strength of the force with which said striking means strikes said ball, and position selection means for selecting the position of the point of impact of said striking force against said ball, said striking means comprising a striking bar and means for mechanically engaging and driving said striking bar in the shooting direction, said striking bar being mounted near its upper end on a horizontal pivot for pivoting movements in a vertical plane, said striking bar striking said ball at the lower end of the bar and in the general area of the lowest point of the swinging movement of the bar, said shooting station including determining support points to determine the position of said ball at said shooting station, said shooting station being in proximity to the ground, said mechanical driving means including positively driven means for abuttingly engaging said striking bar to accelerate said striking bar to initiate a shot and impact said striking bar against said ball with a striking force, and, after impact, continuing to apply said striking force to said ball to provide follow-through, whereby said ball is projected in a selected direction with desired strength.

4,122,823

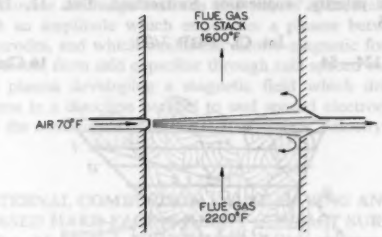
TUBELESS HEAT RECUPERATOR

Robert F. Hunter, Burlington, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Canada

Filed Oct. 7, 1976, Ser. No. 730,959
Claims priority, application United Kingdom, Oct. 8, 1975, 41318/75
Int. Cl.² F28C 3/02
U.S. Cl. 126—117 **4 Claims**

1. Apparatus for transferring heat to combustion air for a furnace from hotter flue gas exiting from the same furnace, the flue gas containing tri-atomic molecules with good infra-red energy absorption characteristics comprising:

conduit means for passing said flue gas in a first direction, aligned nozzle and aperture means on opposed sides of the conduit means for directing the combustion air in jet form transversely across the flue gas flow, to allow triatomic molecules minimally entrained in the jet-form cooler combustion air to provide heat to the cooler combustion air molecules through collision, and by absorbing infra-red energy radiated from the hotter flue gas and passing this absorbed energy to the cooler combustion air molecules also through collision.



4,122,824

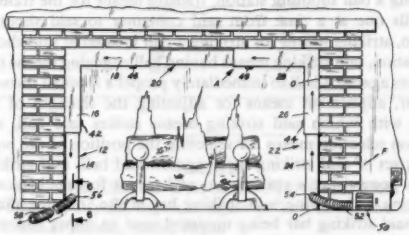
DEVICE FOR EXTRACTING HEAT FROM A FIREPLACE

Peter M. Borgran, 2131 E. Second St., Duluth, Minn. 55812

Continuation of Ser. No. 703,098, Jul. 6, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,492

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **1 Claim**



1. A thermal extractor for a fireplace opening comprising:

(a) an inverted U-shaped tubular member for securing to the front vertical and horizontal edges of the opening of a fireplace to be heated from heat in the fireplace,

(b) said tubular member having a rectangular cross section and including a tubular top central portion having an adjustable length substantially equal to the width of the fireplace opening at the top front edge thereof,

(c) a tubular leg portion depending from each end of said top central portion having an adjustable length substantially equal to the height of the fireplace opening at the front side edge thereof, said legs and said top central portion lying in substantially the same plane,

(d) one of said legs having an inlet tube member at the lower end thereof,

(e) the other of said legs having an outlet tube member at the lower end thereof,

(f) said top central portion having a baffle member internally thereof,

(g) a fan carried by said inlet tube,

(h) said top central portion having a portion slidable within the remaining portion,

(i) each of said legs having a portion slidable within the remaining portion,

(j) means for securing said portions of said top central portion against displacement,

(k) means for securing said portions of each of said leg portions against displacement,

(l) a fan carried by said inlet tube member adapted to circulate heated air through said top central portion and said leg portions and out through said outlet tube member.

4,122,825

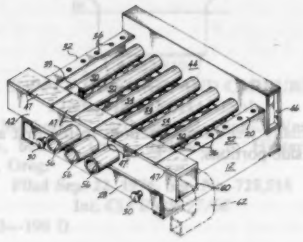
AIR-HEATER TYPE FIREPLACE GRATE

Robert C. Slate, 8225 17th NE, Seattle, Wash. 98115

Filed Mar. 10, 1977, Ser. No. 776,119

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **14 Claims**



1. An air-heater type fireplace grate including tubular portions on which a fire is built and through which forced air is directed to be heated prior to being discharged into a room, characterized by:

a frame comprising a support base adapted to set on the floor of a fireplace firebox, spaced apart tubular front and rear air manifolds occupying upper front and upper rear positions on said base, and means connecting said front and rear manifolds to said base to make said frame an integral rigid structure;

said front and rear tubular air manifolds having opposed pairs of openings formed therein; and

a plurality of air-heating and fire supporting tubes extending between the front and rear manifolds, with end portions thereof snugly received within said openings but free of other connection to the front and rear manifolds so that they can expand and contract independently in response to uneven heating.

4,122,826

SUBMERSIBLE BODY WARMER APPARATUS

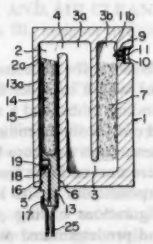
Katumi Suzuki, 15-1 Oozone-cho, Higashi-ku, Nagoya-shi, Aichi-ken, Japan

Filed Dec. 23, 1976, Ser. No. 753,730

Claims priority, application Japan, Dec. 25, 1975, 50/155556

Int. Cl.[2] A61F *7/06*

U.S. Cl. 126—208 **4 Claims**



1. A submersible body warmer apparatus for an underwater diver wearing a wet suit which comprises

a primary pressure reduction device for attachment to a cylinder containing pressurized air carried by a diver,

a mouthpiece to be held in the mouth of a diver for inhala-

tion connected to said reduction device for flow of air from said device to said mouthpiece.

a heat radiating casing body of flattened configuration adapted to be held under a diver's wet suit,

an exhaust opening in said casing body to communicate the interior thereof with the outside and the space defined between a diver's wet suit and his body,

an air supply inlet into said casing body,

a sinuous fluid passage way communicating said inlet with said exhaust opening,

fuel containing means positioned in said passageway,

a combustion chamber in said passageway between said means and said exhaust opening,

an air-pervious, water absorbent member in said passageway between said combustion chamber and said exhaust opening,

check valve means disposed in said exhaust opening to close and open said opening when water pressure is exerted on said valve means and when inner air pressure in said passageway serves to overcome said water pressure, respectively, and

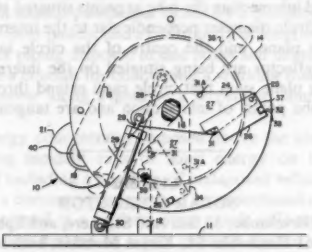
air supply means connecting said inlet to said reduction device.

4,122,827

KINEMATIC SYNCHRONOUS SOLAR HELIOSTAT

William A. Rhodes, 4421 N. 13th Pl., Phoenix, Ariz. 85014

Filed Aug. 25, 1977, Ser. No. 827,750
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **17 Claims**



1. An escapement movement comprising:

a frame,

a shaft rotatably mounted on said frame,

a wheel rotatably supported on said shaft,

an escapement means coupled to said shaft juxtapositioned to said wheel,

a frame mounted stationary unlocking pallet,

at least a pair of spacedly positioned pallets mounted on said wheel,

a first means for rotating said wheel in a first direction,

a second means for rotating said escapement means in a second direction opposite to said first direction,

one of said wheel mounted pallets and said escapement means engaging each other during at least a part of the movement of said wheel in said first direction,

said movement of said first wheel when in engagement with said escapement means causing a storage of potential energy in said second means until said unlocking pallet engages said escapement means causing a decoupling of said escapement means from said wheel,

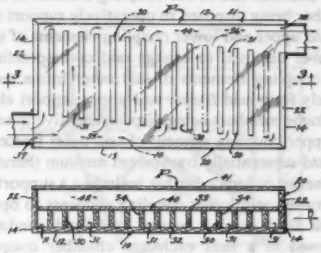
whereby the kinetic energy stored in said second means causes counter rotation of said shaft and said wheel until the other of said wheel mounted pallets engages said escapement means.

4,122,828

SOLAR ENERGY COLLECTOR FOR DIRECT AIR HEATING

Leonard J. DiPeri, 18325 Lahey St., Northridge, Calif. 91324

Filed Nov. 10, 1975, Ser. No. 630,360
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **6 Claims**



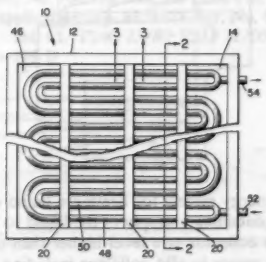
1. A solar heat collector and heat storage panel for the direct and indirect absorption of heat into a moving column of air, and including; a base with a projecting perimeter frame forming an enclosure to be faced openly toward the radiant sun, a heat storage mass in the form of a multiplicity of partitions of substantial body made of wooden heat sink members disposed in spaced parallel relation transversely of the frame and exposed to open uni-directional channels therebetween, inner glazing supportably engaged with said multiplicity of partitions respectively to separately duct the multiplicity of channels, outer glazing spaced from the inner glazing and engaged with the perimeter frame to form a chamber, and inlet and outlet manifold means directing air flow uniformly and transversely through said multiplicity of ducted channels.

4,122,829

SOLAR ENERGY COLLECTOR

Wallace A. Lowe, P.O. Box 1845, Bradenton, Fla. 33506, and Donald E. Robarts, 1311 - 32nd St. West, Brandenton, Fla. 33505

Filed Jul. 9, 1976, Ser. No. 704,065
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A solar energy collector for heating fluids such as water from an external source through absorption of the sun's energy: said solar energy collector comprises an enclosure structured to operatively house a fluid conduit means, said fluid conduit means including an inlet and outlet port to couple said solar energy collector to the external source to circulate fluid between said fluid conduit means and the external source, said enclosure comprising a back member and 9 substantially transparent medium held in fixed spaces relation relative to each other by a frame, said frame comprises inner perimeter frame members disposed on opposite sides of said frame, each said inner frame member comprising an upper and lower coupling

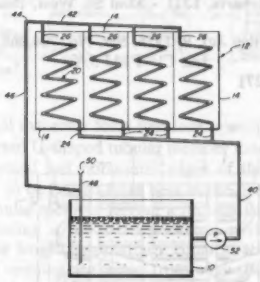
element held in fixed spaced relation relative to each other by an interconnecting element and upper and lower support elements held in fixed spaced relation relative to each other by said interconnecting element, and outer frame members disposed on opposite sides of said frame, each of said outer frame members comprising an upper and lower coupling element held in fixed spaced relation relative to each other by an interconnecting element, said lower coupling element of said outer frame member being disposed to operatively support said back member, said upper and lower coupling elements of said inner frame member disposed to engage said corresponding upper and lower coupling elements of said outer frame member to cooperatively form said frame, said upper support element of said outer frame members being disposed relative to said corresponding upper coupling element of said outer frame member to secure said substantially transparent medium therebetween, said solar energy collector further including a support element coupled between said lower coupling elements to operatively support said fluid conduit means, said fluid conduit means being disposed in a heat exchange chamber cooperatively formed between said back member and said substantially transparent medium to intercept the sun's energy to raise the temperature within said heat exchange chamber to heat the fluid within said fluid conduit means to be fed to the external source.

4,122,830

SOLAR HEATING SYSTEM

William H. Hapgood, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 27, 1976, Ser. No. 727,067
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **10 Claims**



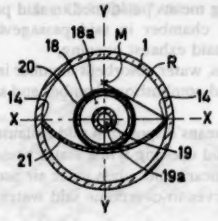
1. A solar energy system for heating a liquid comprising a reservoir for containing a supply of the liquid to be heated, at least one solar collector at a level higher than the reservoir, liquid conduit means in said collector including an inlet at a low point in the collector and an outlet at a high point in the collector, and piping connecting said inlet to said outlet, said piping throughout its length being pitched upwardly from the inlet to the outlet, a feed pipe connected at one end to said reservoir and pitched upwardly toward and connected to said inlet, a return pipe connected at one end to the reservoir and pitched upwardly therefrom to a peak level point above said outlet, a connector pipe connected to said outlet and pitched upwardly therefrom toward and connected to said peak level point of the return pipe, and pump means in said feed line for pumping liquid from the reservoir through the feed line, inlet, piping, outlet, connector pipe, and return pipe.

4,122,831

SOLAR COLLECTOR COMPRISING AN ELONGATE ABSORBER IN AN EVACUATED TRANSPARENT TUBE

Faramarz Mahdjuri, Aachen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,916
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618651
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **8 Claims**



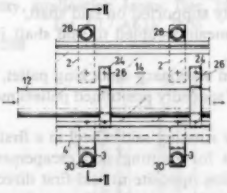
1. A solar collector which comprises a sealed and evacuated transparent tube that has a circular cross-section over at least a portion of its length, an internal reflector having an arcuate cross-section of substantially 120° and extending substantially co-extensive with said length portion, and an absorber having at least one duct for transferring heat derived from solar radiation incident on the absorber to a heat transport medium in the duct during operation and extending longitudinally of said tube with its largest transverse dimension in the symmetry plane of said internal reflector, said absorber being centrally arranged in the tube, said reflector being in engagement with the absorber and intersecting the tube at points situated at the ends of the tube circle diameter perpendicular to the internal reflector symmetry plane, and the centre of the circle including the internal reflector arc being situated on the internal reflector symmetry plane such that circle radii extend through the reflector/tube points of intersection and are tangent to the absorber.

4,122,832

SOLAR COLLECTOR

Ladislav Hirschsohn, 30 Ben Ami St., Acre, and Ephraim Hirschsohn, 61 Hashoftim St., Kiryat Motzkin, both of Israel

Filed May 4, 1977, Ser. No. 793,546
Claims priority, application Israel, May 14, 1976, 49575
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 **9 Claims**



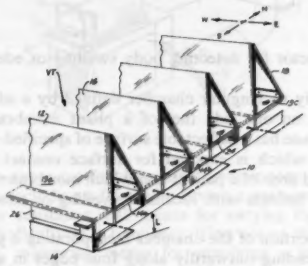
1. A solar collector for heating a liquid by solar radiations, comprising: an extrusion having at least one straight longitudinally-extending recess formed therein of semi-circular cross-section; a straight tube disposed within the longitudinally-extending recess for the liquid to be heated by the solar radiations; said tube being of circular cross-section and having an outer diameter substantially equal to the diameter of the semi-circular recess; and a transparent window overlying the extrusion and the straight tube disposed within its recess, said extrusion being of plastics material, and the tube being of metal, the collector further including a metal absorber having a solar-

radiation-absorbing surface facing said window, the metal absorber including a longitudinally-recessed portion underlying and in contact with the metal tube.

4,122,833
NON-TRACKING SOLAR ENERGY COLLECTOR SYSTEM

Alan M. Lovelace, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and M. Kudret Selcuk, La Canada, Calif.

Continuation-in-part of Ser. No. 765,139, Feb. 3, 1977, Pat. No. 4,091,798. This application May 27, 1977, Ser. No. 801,452
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **1 Claim**



1. A non-tracking solar energy collector system for heating a working fluid comprising:

A. a flat plate receiver including a plurality of uniformly spaced insulated boxes of elongated configurations disposed in mutual parallelism closed by a plurality of transparent cover panels, and a multiplicity of lengths of finned absorber piping disposed in said boxes and interconnected to form a conduit for conducting a working fluid through the receiver along a path of a serpentine configuration; and

B. an energy concentrator disposed above the receiver for directing incident rays of solar energy on the boxes thereof including a plurality of juxtaposed reflector modules of a common asymmetrical cross-sectional configuration arranged in a uniform array, each reflector module being characterized by a pair of plates formed of a lightweight metal and having a pair of reflecting surfaces facing north-south directions and disposed in a pair of planes inclined at mutually distinct angles with respect to the plane of the flat plate receiver and intersecting above the plane of the receiver for defining therebetween an included angle equal to an included angle defined between intersecting planes of the plates of each pair of adjacent modules, and module support means for independently supporting said reflector modules including parallel straps having raised segments arranged in uniformly spaced relation for receiving therebetween said boxes and receiving thereon the opposite ends of said modules.

4,122,834
VENTILATING, COOLING AND HEAT RECLAIMING APPARATUS FOR COOKING EQUIPMENT

Eugene A. Jacobs, 7112 Darlington Dr., Baltimore, Md. 21234

Filed Apr. 4, 1977, Ser. No. 784,640
Int. Cl.[2] F24C *15/08;* **F23J** *11/00*
U.S. Cl. 126—299 D **8 Claims**

1. A venting and cooling system for use with cooking equipment comprising:

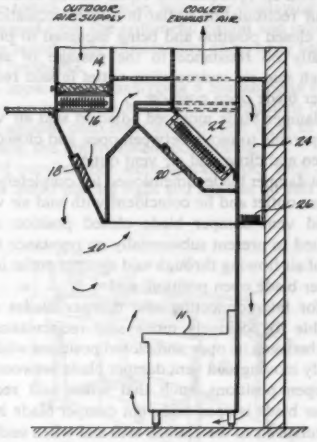
first duct means defining a supply passage for supplying fresh air to the vicinity of the equipment,

second duct means defining an exhaust passage for exhausting air from the vicinity of the equipment,

filter means disposed in said exhaust passage for removing particulate matter and droplets from the exhausting air,

a cooling coil disposed in said exhaust passage for cooling the exhausting air to improve removal of said particulate matter and droplets,

means connected to said cooling coil for supplying a fluid to said cooling coil at a temperature below the temperature of said exhausting air,



a further coil disposed in said supply passage for changing the temperature of said supply air,

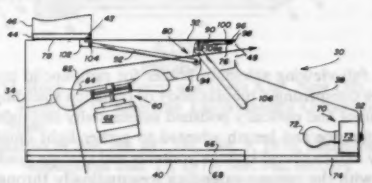
means connecting said cooling coil to said further coil for supplying the fluid leaving said cooling coil to said further coil, and

valve means disposed in said connecting means for controlling flow of said fluid from said cooling coil to said further coil.

4,122,835
VENTING AND RECIRCULATING VENT KITCHEN HOOD

Leon O. Bowen, Jr., and Michael T. McVean, both of Cleburne, Tex., assignors to Rangaire Corporation, Cleburne, Tex.

Division of Ser. No. 700,216, Jun. 28, 1976, Pat. No. 4,088,123. This application Sep. 23, 1977, Ser. No. 836,100
Int. Cl.[2] F24C *15/20;* **F23J** *11/00*
U.S. Cl. 126—299 D **8 Claims**



1. A kitchen stove hood for selectively providing air ventilation or recirculation in a kitchen area comprising:

a hood dimensioned to be disposed in the kitchen area over a stove and having top, bottom, sides, back and front portions;

said hood including an air intake opening at said bottom portion;

a fan for causing air from the kitchen area to flow through said air intake opening;

an air recirculation outlet communicating with said air intake opening and disposed in said hood for recirculating air to the kitchen area;

an air vent outlet communicating with said air intake opening and disposed in said hood for venting air from the kitchen area;

a recirculation damper blade mounted adjacent said air recirculation outlet and operable to move between open and closed positions to open and close said air recirculation outlet;

said recirculation damper blade dimensioned to completely close said air recirculation outlet and lie coincident with said air recirculation outlet in said recirculation damper blade closed position and being mounted to present substantially no resistance to the passage of air flowing through said air recirculation outlet in said recirculation damper blade open position;

a vent damper blade mounted adjacent said air vent outlet and operable to move between open and closed positions to open and close said air vent outlet;

said vent damper blade dimensioned to completely close said air vent outlet and lie coincident with said air vent outlet in said vent damper blade closed position and being mounted to present substantially no resistance to the passage of air flowing through said air vent outlet in said vent damper blade open position; and

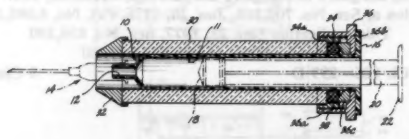
means for interconnecting said damper blades and being operable to positively move said recirculation damper blade between its open and closed positions while simultaneously moving said vent damper blade between its closed and open positions, such that when said recirculation damper blade is open said vent damper blade is closed to recirculate air to the kitchen area and when said recirculation damper blade is closed said vent damper blade is open, to vent air outside the kitchen area.

4,122,836

SHIELDING HOLDER FOR RADIONUCLID SYRINGES

Thomas W. Burnett, Bellevue, Wash., assignor to Nuclear Pacific, Inc., Seattle, Wash.

Filed Sep. 13, 1976, Ser. No. 722,538
Int. Cl.² A61N *5/12*
U.S. Cl. 128—1.1 **5 Claims**



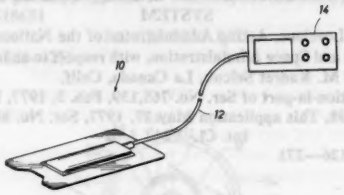
1. A full-viewing shielding holder for radionuclid injection syringes comprising a tubular body of radiation shielding glass transparent and optically polished substantially throughout its circumference and length adapted to gather light omnidirectionally and to reveal syringe contents and syringe graduation marks with the syringe extending longitudinally through said tubular body independently of its relative rotated position in said tubular body and of the tubular body's rotated position relative to the viewer, manually releasable gripping means fitted on one end of said tubular body manually operable to grip and hold the syringe against shifting therein when the syringe is being operated in the holder, said gripping means comprising an elastic ring positioned to closely encircle the syringe adjacent one end of the tubular body, and retainer means including annular clamping means manually operable to compress the elastic ring and constrict the same under pressure against the syringe and to release the syringe thereafter from such pressure.

4,122,837

BODY SURFACE CONTOUR DEFORMATION

Loren W. Leonard, 162 Plantation, Houston, Tex. 77024

Filed Aug. 2, 1976, Ser. No. 710,711
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **4 Claims**



1. A detector for detecting body swelling or edema, comprising:

a generally rectangular chamber defined by a stiff portion having on one side thereof a pliant membrane which membrane has a deflectable surface of specified width and length which is exposed for surface contact against a selected area of a patient and which membrane conforms to and deflects with localized swelling or edema of the patient;

the stiff portion of the chamber incorporating a protruding lip extending outwardly along four edges in a common plane;

a side wall appended to said lip and extending above the membrane and which side wall is interrupted by an opening means connected through a hollow tube adapted to be connected to an alarm device;

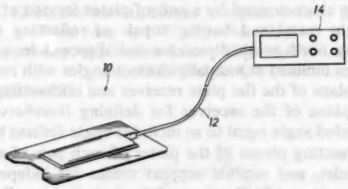
and wherein said surrounding lip is notched at a portion thereof to define an alignment means for a needle or catheter.

4,122,838

BODY SURFACE CONTOUR DEFORMATION SENSOR

Loren W. Leonard, 162 Plantation, Houston, Tex. 77024

Filed Aug. 9, 1976, Ser. No. 712,508
Int. Cl.² A61B *5/10*
U.S. Cl. 128—2 S **3 Claims**



1. A detector for detecting body swelling or edema, comprising:

a chamber defined by a stiff portion encircled by a skirt of specified width and which skirt is exposed for contact and sealing against a selected area of a patient to enable localized swelling or edema of the patient;

the chamber being generally rectangular and open on one side thereof;

the skirt extending outwardly along four edges in a common plane;

a side wall appended to said skirt and which side wall is interrupted by an opening means connected through a hollow tube adapted to be connected to an alarm device; and

wherein said surrounding skirt is notched at a portion thereof to define an alignment means for a needle or catheter.

4,122,839
APPARATUS FOR THE DETERMINATION OF RESPIRATORY PASSAGEWAY RESISTANCE

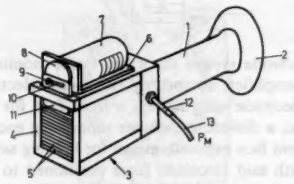
Manfred Franetzki, Erlangen; Volker Korn, Nurnberg, and Karl Prestele, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 559,655, Mar. 18, 1975, Pat. No. 4,022,193. This application Jan. 26, 1977, Ser. No. 762,952

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1974, 2413960; France, Nov. 28, 1974, 74 38991

Int. Cl.[2] A61B *5/08*

U.S. Cl. 128—2.08 **1 Claim**



1. In an apparatus for determining respiratory passageway resistance, including a flow tube having a passageway including a flow resistance with means for varying the resistance value periodically at a frequency lying above the breathing frequency, measuring means for supplying a measurement signal which varies in accordance with a parameter of the flow in the flow tube, the improvement comprising: said flow resistance comprising a single fixed resistance extending across the passageway of said flow tube and having a flow surface determining a basic resistance value R_o; and sinusoidally variable shutter means as resistance value varying means associated with said flow surface of said single fixed resistance for the periodic, substantially sinusoidal superposition of resistance variations r onto said basic resistance value; said measuring means comprising flow measuring means connected to said flow tube and having first and second measurement passageways connected to the output of said flow measuring means, a first frequency filter in said first measurement passageway, a second frequency filter in said second measurement passageway, said first frequency filter having a frequency characteristic for ascertaining flow components V_o due to low frequency breathing, and the second frequency filter having a frequency characteristic for ascertaining flow components v due to the higher frequency resistance variations caused by said shutter means, and further comprising circuit means connected to the outputs of said first and second measurement passageways to provide the respiratory passageway resistance R_{aw} from the lower and higher frequency flow components V_o and v obtained from said measurement passageways, and from the resistance values R_o and r in accordance with the relationship

$$R_{aw} = R_o\left(\frac{r}{R_o}\cdot\frac{V_o}{v} - 1\right).$$

4,122,840
APPARATUS FOR ANALYZING THE BALANCING FUNCTION OF THE HUMAN BODY

Kazuo Tsuchiya, Nagoya, and Noboru Ohnishi, Okazaki, both of Japan, assignors to Yaesu Rehabili Co., Ltd., Tokyo, Japan

Filed May 23, 1977, Ser. No. 799,690

Claims priority, application Japan, Jun. 1, 1976, 51-63879

Int. Cl.[2] A61B *5/10*

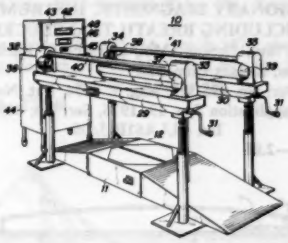
U.S. Cl. 128—2 S **11 Claims**

1. In an apparatus for analyzing human body's balancing function adapted to analyze the body load distributions of a person tested and applied onto his right and left feet so as to adjust his body balance, the improvement comprising: a pair of parallel foot steps spaced from each other, the person tested placing right and left feet on said foot steps; a plurality of body load detectors within said foot steps so as to detect body load distributions applied onto the right and left feet of the person tested;

an arithmetic circuit for receiving the body load signals detected by the plurality of body load detectors and developing a difference signal corresponding to the body load distributions applied onto the right and left feet of the person tested; and display means for displaying the difference signal from the arithmetic circuit and informing the person tested of the adjustability of his body balancing by visual feedbacks.

6. In an apparatus for analyzing a human body's balancing function by analyzing the body load distributions of a person tested and applied onto right and left feet so as to adjust the body balance, the improvement comprising;

a pair of parallel foot steps spaced from each other, the person tested placing right and left feet on said foot steps;



a plurality of body load detectors within said foot steps for detecting the body load distributions applied onto the right and left feet of the person tested;

an arithmetic circuit for receiving the body load distribution signals detected by said body load detectors and developing a difference signal of the body load distributions applied onto the right and left feet of the person tested;

a target signal generator providing target signals in the view of the person on the foot steps to render his balanced body load distribution into unbalanced condition;

target signal display means for receiving said target signals and displaying the same; and

display means for displaying the difference signal from the arithmetic circuit and/or the transfers of the body load distributions of the person tested when reacting while viewing the target signals shown on the target signal display means.

4,122,841
PROBE TIP

Erwin H. Rock, Dobbs Ferry, and Irwin Klar, New City, both of N.Y., assignors to American Electromedics Corporation, Acton, Mass.

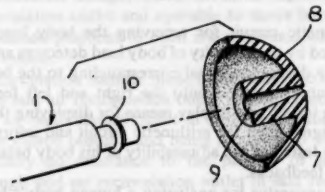
Continuation of Ser. No. 647,752, Jan. 9, 1976, abandoned. This application Jun. 17, 1977, Ser. No. 807,591

Int. Cl.[2] A61B *10/00, 5/12*

U.S. Cl. 128—2 Z **1 Claim**

1. In an improved replaceable and resilient and compressible tip for a test probe for forming an air tight seal between the probe and the ear canal of an ear being tested and having a central support portion with an elongated probe mounting aperture extending through said support portion the improvements comprising said aperture flaring outwardly toward one end of the support portion, a flange projecting radially outwardly from the other end of said support portion, said flange having a convex outer surface for engaging a ring-like area on the wall of the entrance to the outer ear canal to form the seal and having a concave inner surface generally parallel to said

convex outer surface and cooperating to form a C-shaped flange of uniform cross-section with the flange edge being the



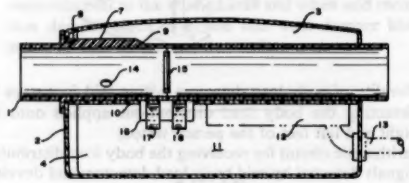
radially outermost portion of the tip, and said support portion and said flange having generally equal dimensions parallel to the elongated probe mounting aperture.

4,122,842

PULMONARY DIAGNOSTIC INSTRUMENT INCLUDING BREATH TRANSDUCER

Richard E. Pikul, DeSoto, Mo., assignor to Puritan Bennett Corporation, Kansas City, Mo.

Division of Ser. No. 495,329, Aug. 7, 1974, Pat. No. 3,946,726. This application Jan. 19, 1976, Ser. No. 649,986
Int. Cl.² A61B *5/08*
U.S. Cl. 128—2.08 **11 Claims**



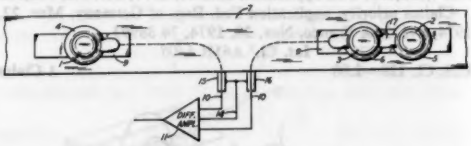
1. A diagnostic instrument for use in detecting lung disfunction through specimen breathing and comprising a flow tube means adaptable for accommodating the flow of the breath therethrough, a resiliently mounted diaphragm means disposed within said tube means and subject to lineal displacement due to the force of the moving breath thereby, said diaphragm means comprising a plate means, said plate means having at least one aperture therethrough for allowing the unobstructed passage of the breath there past, said plate means suspended within said flow tube means to provide for its complete and uniform lineal displacement due to the force of the breath moving through the flow tube means, suspension means supporting the plate means within the flow tube means, said suspension means providing for centrally mounting of the said plate means within the said tube means, said suspension means including a pair of supports disposed diametrically across the interior of the tube means and spaced from each other a fixed distance, a rod member extending the distance between and connecting to said supports, said apertured plate means having said rod extending centrally therethrough without obstructing the lineal movement of said plate means with respect to said rod, at least one annulus connecting peripherally of the plate means and in proximity with the inner surface of the flow tube means, a series of resilient arcuate arms interconnecting between said annulus and rod member to provide for suspension of the apertured plate means and its lineal displacement during passage of specimen breath therethrough, and means cooperating with said flow tube means for detecting the degree of lineal displacement of said diaphragm means for providing representative information pertaining to pulmonary functioning for specimen diagnosis.

4,122,843

ELECTRODE SYSTEM FOR A HEART RATE MONITOR

Ronald J. Zdrojkowski, Pittsburgh, Pa., assignor to Electro-Technics, Inc., Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,283
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 E **8 Claims**



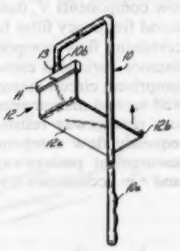
1. An electrode system for a heart rate monitor having a differential amplifier, comprising two signal electrodes and a reference electrode each having a front face for engaging a person's skin, a dielectric member supporting each electrode with said front face exposed, means for holding said dielectric members with said electrode faces positioned to engage the skin, electro-static shields embedded in the dielectric members that support the signal electrodes, the shield being behind the signal electrodes and electrically insulated therefrom, a first pair of electrical conductors connected to the signal electrodes and adapted to electrically connect them with a differential amplifier, a second pair of electrical conductors connected to said shields and adapted to electrically connect them to the common input of the amplifier, and means electrically connecting one of said shields with said reference electrode.

4,122,844

SURGICAL RETRACTOR

Philipp Rabban, P.O. Box 390942, Miami Beach, Fla. 33139

Filed Mar. 7, 1977, Ser. No. 775,138
Int. Cl.² A61B *17/02*
U.S. Cl. 128—20 **5 Claims**



1. A hand held surgical retractor comprising a shaft, the shaft having a first portion and a second portion, the second portion being oriented substantially perpendicularly to the first portion, an arm rigidly connected to one end of the second shaft portion and a flat blade rigidly connected to the arm, an end of the first shaft portion being free, a handle being formed at the free end of the first shaft portion, the shaft and the arm lying in the same plane and the blade having a portion extending substantially perpendicularly to said plane and having a free end, a lip formed at said free end and extending away from said handle, the axis of a portion of the shaft including the handle being substantially perpendicular to the plane of said flat blade and laterally offset from said portion of the blade and said end of said first shaft portion being substantially spaced from the plane of said blade portion.

4,122,845

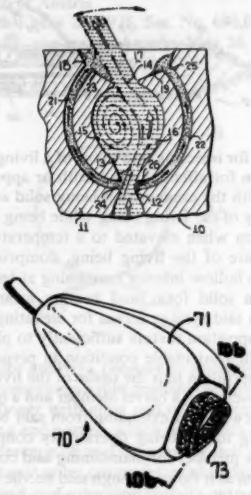
PERSONAL CARE SPRAY DEVICE

Ronald D. Stouffer, Silver Spring, and Harry C. Bray, Jr., Beltsville, both of Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.

Division of Ser. No. 618,208, Sep. 30, 1975, Pat. No. 4,052,002, which is a continuation of Ser. No. 510,722, Sep. 30, 1974, abandoned. This application Jul. 22, 1977, Ser. No. 818,215

Int. Cl.[2] A61H *9/00*

U.S. Cl. 128—66 5 Claims



1. A personal spray device characterized by a nozzle which issues a liquid jet which is swept in at least one dimension transverse to the nominal jet flow direction, causing said jet to break up into liquid droplets, said device comprising:

a body member;

an inlet means defined in said body member for receiving liquid under pressure;

means for establishing a liquid pressure inside said body member which is greater than ambient pressure;

jet-defining means within said body member responsive to the received liquid for forming said liquid jet;

an outlet opening defined in said body member for issuing said jet exteriorly of said body member, said outlet opening being elongated in at least said one dimension transverse to the flow direction of said jet therethrough;

jet-sweeping means operated solely by the pressure of said liquid and located within said body member for repetitively sweeping said jet in at least said one dimension; and

a guard member projecting from said body member and disposed about said outlet opening.

4,122,846

BUBBLING DEVICE FOR THE TREATMENT OF THE HUMAN BODY

Ludwig G. Baumann, am Reckholder, CH Niederbelfenschwil, Switzerland

Filed Mar. 8, 1977, Ser. No. 775,602

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628248; Mar. 10, 1976, 2609786; Mar. 12, 1976, 2610342; Jul. 27, 1976, 2633625

Int. Cl.[2] A61H *9/00*

U.S. Cl. 128—66 9 Claims

1. Bubble device for treating the human body, comprising

a support element having two alternatively usable body-supporting surfaces each of which faces away from the other;

a plurality of relatively small first outlet openings for the bubble medium formed in one of said support surfaces;

a plurality of relatively large second outlet openings for the bubble medium formed in the other of said support surfaces;

first means for supplying bubble-forming medium to said first outlet openings; and

independent second means for supplying bubble-forming medium to said second outlet openings.

4,122,847

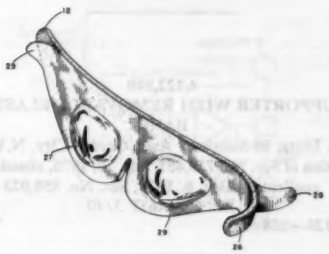
PROTECTIVE EYE SHIELD FOR SURGICAL PATIENTS

Robert G. Craig, 1915 Summit Ridge Dr., Escondido, Calif. 92025

Continuation of Ser. No. 620,814, Oct. 8, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,291

Int. Cl.[2] A61F *9/04*

U.S. Cl. 128—132 R 2 Claims



1. A protective eye shield for a surgical patient comprising:

a unitary flexible, soft and relatively thick, foamed, plastic blank means of substantially uniform thickness, having a substantially flat surface and shaped for covering a patient's lower forehead, across and beneath the eyes, and across the upper nose bridge, and having a pair of opposite openings over the eyes, said flat inner surface having a contact adhesive entirely around the peripheral portion thereof for securing the eye shield to the patient,

a pair of thin, transparent, plastic covers overlying said openings, each cover having a flange terminating in a peripheral edge extending therearound, and which flange is secured to the inner mask surface around said openings, and

tape, relatively thin as compared to the thickness of said foamed, plastic blank means, secured to said inner mask surface and substantially entirely around said flange to overlie said peripheral cover edge, whereby a patient is protected from said edge by said tape.

4,122,848

SURGICAL DRAPE SUPPORT

Emmett F. Carpel, 2683 E. Lake of the Isles Blvd., Minneapolis, Minn. 55408

Filed Apr. 28, 1977, Ser. No. 791,928

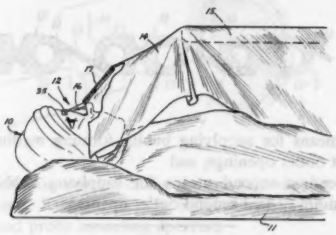
Int. Cl.[2] A61B *19/06*

U.S. Cl. 128—132 D 15 Claims

1. A surgical drape support to space a surgical drape from the breathing area of a supine surgical patient during an ophthalmologic surgical procedure, comprising:

base means mountable to a portion of the face of the surgical patient;

holder means secured to the base means and extended therefrom to a location above the nose and mouth of the patient over the breathing area of the patient and away from the



eyes of the patient when the base means is mounted on the face of the patient, to support a surgical drape above the breathing area of the patient; and a surgical drape supported on the holder means over the breathing area of the patient to permit unimpeded breathing of the patient during an ophthalmologic surgical procedure.

4,122,849

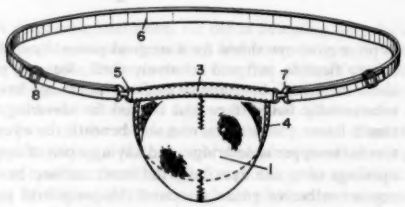
CUP SUPPORTER WITH REMOVABLE ELASTIC HIP BAND

Henry G. Dietz, 80 Salisbury Ave., Garden City, N.Y. 11530

Continuation of Ser. No. 723,451, Sep. 15, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 858,023

Int. Cl.[2] A61F 5/40

U.S. Cl. 128—158 **5 Claims**



1. A supporter comprising a cup-shaped hook pouch; said hook shaped pouch comprises a non-circular flexible laminate comprising sheet foam rubber and fabric, means of sewing adjacent edges of said non-circular flexible laminate to form a partial sphere, whereby said partial sphere is defined as a sphere cut by a second imaginary sphere whose center point is some distance from said partial sphere's center point forming a compartment curved to a hook shape; an elastic secured to top edge of said compartment curved to a hook shape, said elastic provides means for fastening half circular loops or hooks to said compartment curved to a hook shape; bias tape secured to sides and bottom edges of said compartment curved to a hook shape; a single adjustable elastic belt comprising an elastic belt, two buckles having said elastic belt's two ends threaded through the said buckles to form loops from said elastic belt's two ends, said loops are threaded through a second set of half circular loops or hooks having means to accept said loops from said elastic belt; said half circular loops and said hooks function with said second set of half circular loops or hooks to allow detaching said single adjustable belt from said hook shaped pouch.

4,122,850

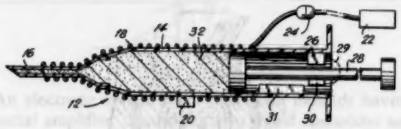
APPARATUS FOR PROVIDING LIVING BEINGS WITH ABSORBABLE IMPLANTS

Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741

Division of Ser. No. 693,134, Jun. 7, 1976, Pat. No. 4,030,499, which is a continuation-in-part of Ser. No. 537,572, Dec. 30, 1974, Pat. No. 3,982,537. This application Apr. 6, 1977, Ser. No. 785,290

Int. Cl.[2] A61M 5/00

U.S. Cl. 128—216 **24 Claims**



1. Apparatus for injecting into tissue of a living being at least one composition for affecting the health or appearance of the living being, with the composition being solid at the temperature of the body of the living being while being injectable in a molten condition when elevated to a temperature above the body temperature of the living being, comprising a syringe means having a hollow interior containing at least one of said compositions in solid form, and heating means operatively connected with said syringe means for elevating the temperature of the composition therein sufficiently to place said composition in molten injectable condition in preparation for injecting the composition into the tissue of the living being, said syringe means including a barrel member and a needle member connected therewith and extending from said barrel member, and said heating means being operatively connected at least with said needle member for maintaining said composition in a molten condition as it flows through said needle member while the latter is situated at least in part in tissue of the living being.

4,122,851

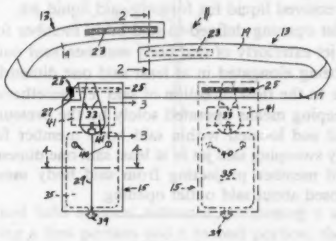
CARRIER AND SKIN-PROTECTING COVER FOR URINE BAGS

Dolores E. Grossner, 427 E. Jackson, Virden, Ill. 62690

Continuation of Ser. No. 685,983, May 13, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,332

Int. Cl.[2] A61F 5/44

U.S. Cl. 128—295 **5 Claims**



1. A skin-protecting carrier for disposable urine bags of known construction and each having an input and an output drainage nipple, comprising: a body-encircling and usually-skin-contacting belt of soft relatively non-skin-irritating material, at least one bag-holding pouch of soft relatively non-skin-irritating material depending in usually-skin-contacting position from said belt and having a small opening in its bottom for extension therethrough of the drainage nipple of said bag, said pouch having an opening in the upper portion of its front panel to facilitate attachment and detachment of tubes to and from the input nipple of said bag, a reinforcing tubeanchoring patch fixed to the rear panel of said pouch opposite said opening, and

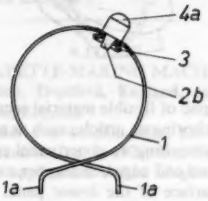
pairs of mating snap-fasteners fixed to the front and rear panels of said pouch and positioned to bag-positioningly interengage through sealed openings in the upper corners of said bag of known construction.

4,122,852

DEVICE FOR APPLYING PRESSURE TO A SELECTED POINT OF A HUMAN FINGER

Wilfried Knetsch, Babenbergergasse 7/1, 2340 Mödling, and Elissabeth Petricek, Anton Brucknergasse 9, 3400 Klosterneuburg, both of Austria

Filed May 25, 1976, Ser. No. 690,029
Claims priority, application Austria, May 26, 1975, 4002/75
Int. Cl.[2] A61B *17/00*
U.S. Cl. 128—303 R **7 Claims**



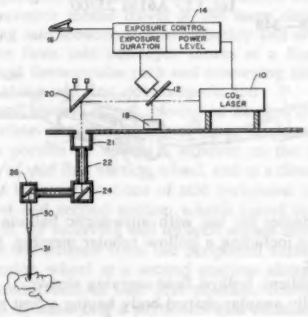
1. A device for applying pressure to a selected point on the human finger comprising a split resilient clamping ring engageable over the finger with inner and outer circumferential surfaces and having end portion which cross each other at a point on the circumference of said ring and which extend radially outwardly from said outer circumferential surface, an actuating projection on said ring extending radially outwardly from said outer circumferential surface, pressure means connected to said actuating projection and extending radially inwardly therefrom and radially inwardly of said inner circumferential surface, and including a centering cup in the form of a dish which is concave radially inwardly toward the center of said ring, surrounding said pressure means on the inner circumference of said ring.

4,122,853

INFRARED LASER PHOTOCAUTERY DEVICE

Michael R. Smith, Thousand Oaks, Calif., assignor to Spectra-Med, Thousand Oaks, Calif.

Filed Mar. 14, 1977, Ser. No. 777,390
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 **21 Claims**



1. An apparatus for treating by cauterizing or cutting blood vessels and other biological tissue comprising:

laser beam generating means for generating a tissue absorbent laser beam;

optical means for manipulating, focusing and delivering the laser beam to a desired location in an absorptive medium while isolating the surrounding and intervening medium from the beam, said optical means including;

a laser light guide means,

window means transparent to said laser beam sealing said laser light guide means,

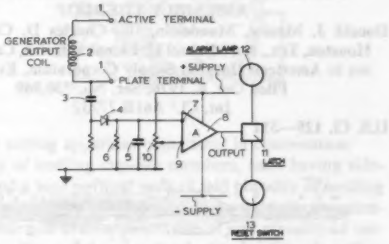
automatic control means for controlling the intensity and duration of said laser beam.

4,122,854

ELECTROSURGICAL APPARATUS

John H. Blackett, London, England, assignor to Matburn (Holdings) Limited, London, England

Filed Aug. 14, 1974, Ser. No. 497,317
Claims priority, application United Kingdom, Aug. 23, 1973, 39991/73
Int. Cl.[2] A61N *3/02*
U.S. Cl. 128—303.13 **6 Claims**



1. A radio-frequency electrosurgical device which comprises a radio-frequency generator, a power lead and a return lead, means for coupling the power lead and the return lead to the radio-frequency generator, an active electrosurgical electrode, means for coupling the power lead to the active electrosurgical electrode to power the active electrode, a passive electrode, means for coupling the passive electrode to the return lead, a high impedance connection coupling the return lead to ground at a point between the passive electrode and the ratio-frequency generator, voltage monitoring means coupled across the high impedance connection for indicating a predetermined voltage drop imposed across the high impedance connection.

4,122,855

CUTTING TOOL

Jirayr Tezel, 221 Falmouth Rd., Scarsdale, N.Y. 10583

Filed Dec. 27, 1971, Ser. No. 212,304
Int. Cl.[2] A61B *17/16*
U.S. Cl. 128—310 **13 Claims**

1. A cutting tool for forming removable plugs and sockets in the skin of the scalp of a person, comprising:

(a) an elongated handle;

(b) a hollow cylindrical cutting head detachably mounted to the handle at one end thereof;

(c) the head having a tapered portion at one end thereof

terminating in a circular knife edge for cutting into said skin; and

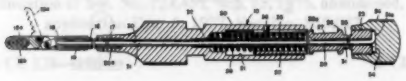
(d) the head including at least one bleed hole extending through the side wall thereof.

4,122,856

SURGICAL INSTRUMENT AND METHOD OF ASSEMBLY THEREOF

Donald J. Mosior, Mundelein, Ill.; Charles D. Cawood, Jr., Houston, Tex., and Michael H. Ekinaka, Irvine, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Oct. 8, 1976, Ser. No. 730,869
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—311 **12 Claims**



1. A surgical instrument comprising an elongated tubular sheath having a passage therethrough, a jaw assembly detachably connected to said sheath at one end thereof, a fixation housing secured to the opposite end of said sheath, said housing having a plunger chamber communicating with said passage, a plunger disposed within said chamber and having an axial bore therethrough aligned with said passage, an actuation rod extending through said passage and bore and operatively connected at one end to said jaw assembly, spring means urging said plunger in a direction extending axially and outwardly from said chamber, stop means at the outer end of said rod opposite from said one end thereof, said stop means projecting laterally relative to the axis of said plunger and normally engaging the plunger's outer end for precisely limiting the extent of outward travel of said plunger without preventing axial inward movement of said plunger independently of said rod and stop means, said outer end of said plunger being externally threaded, and a terminal member detachably connected to said plunger and having a recess receiving both said outer end of said plunger and said stop means, said terminal member being internally threaded for threadedly receiving the plunger's outer end and confining said stop means within said recess to secure said plunger and rod against independent axial movement, said stop means being separable from said rod and being exposed for separation when said terminal member is detached, whereby, upon detachment of said terminal member from said plunger, said plunger may be shifted inwardly independently of said rod to permit removal of said stop means, and upon removal of said stop means, said jaw assembly may be detached from said one end of said sheath and said actuation rod may be axially withdrawn from said housing and plunger.

4,122,857

PAD FOR ANCHORING AN ARTICLE TO THE SKIN OF A PATIENT

Raymond H. Haerr, Cincinnati, Ohio, assignor to Xomed Inc., Jacksonville, Fla.

Filed Jan. 25, 1977, Ser. No. 762,777
Int. Cl.[2] A61M *25/02*
U.S. Cl. 128—348 **14 Claims**

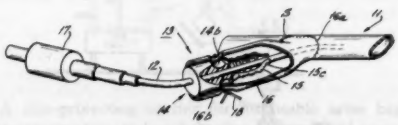
1. A composite pad of flexible material securable to the skin of a patient for anchoring an article, such as a catheter tube or the like thereto, comprising an upper panel and a lower panel each having side and end edges, and upper and lower surfaces with the upper surface of the lower panel confronting the lower surface of the upper panel; an adhesive coating the lower surface of the lower panel; a first removable backing sheet overlying the adhesive surface of the lower panel; an adhesive coating interposed between said upper and lower panels; a portion of the lower surface of the upper panel in contacting, adhesively secured, overlying relationship with a like portion of the lower panel; a second removable backing sheet in face-to-face relationship with the confronting surfaces of said upper and lower panels and overlying and coating, the interposed adhesive coating said upper panel including a flap which is integral with, and hingedly secured, along an edge to that portion of the upper panel which is secured to the lower panel; the lower surface of the lower panel adapted to be affixed to the skin of a patient upon removal of the first backing sheet; the lower surface of the flap adapted to be affixed to the underlying portion of the upper surface of the upper panel upon removal of the second backing sheet for anchoring an article, interposed between the adjacent surfaces of the flap and the lower panel to the pad.

4,122,858

ADAPTER FOR INTRA-AORTIC BALLOONS AND THE LIKE

Peter Schiff, Box 354, Rte. 7, Cookeville, Tenn. 38501

Filed Mar. 23, 1977, Ser. No. 780,295
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—348 **9 Claims**



1. An adapter for use with intra-aortic balloon assemblies and the like including a hollow tubular member, the adapter comprising:

a first resilient, hollow fluid carrying sleeve;

a generally annular-shaped body having a first portion of a first diameter and a second portion integral with said first portion and being of a reduced diameter relative to said first portion;

an elongated bore extending through both the larger and

smaller diameter portions of said body and communicating with both end surfaces thereof;

a second resilient, stretchable plastic sleeve having a first portion thereof positioned about the end of the second portion of said body and having an opening adapted to receive an elongated hollow flexible tubular member;

the remaining portion of said second sleeve extending beyond the end of said second portion and adapted to embrace and form a sliding, fluid-tight seal about the tubular member extending through the bore in said body so as to allow the adapter to be slidably positioned at any point along said tubular member while maintaining the integrity of said sliding seal;

said adapter being inserted into said first sleeve; and

an annular groove being provided about the periphery of the first portion of said body to facilitate the tying of a suture about said first sleeve to urge the first sleeve into a fluid-tight seal with said body.

4,122,859

CIGARETTE-MAKING MACHINES

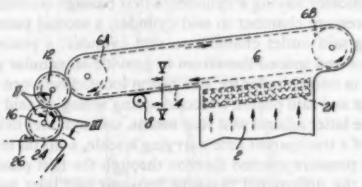
Edward G. Preston, Deptford, England, assignor to Molins Limited, London, England

Continuation of Ser. No. 449,808, Mar. 11, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,113

Claims priority, application United Kingdom, Mar. 13, 1973, 12033/73

Int. Cl.[2] A24C *5/00*

U.S. Cl. 131—84 B **4 Claims**



4. In a cigarette making machine including conveyor means arranged for movement along a predetermined path, means for showering tobacco onto said conveyor means to build up a continuous tobacco stream thereon and means spaced from said conveyor means for conveying a continuous wrapper web in a direction away from said conveyor means along a substantially horizontal path, the improvement comprising the combination of

(a) a first suction wheel, having an air-pervious peripheral surface arranged to travel along a first circular path, a portion of which is adjacent to the path of said conveyor means, and in a direction such that the adjacent portions of said peripheral surface of said first suction wheel and of said conveyor means travel in the same direction, for receiving said tobacco stream smoothly and without disturbance from said conveyor means at a first position along said first circular path and conveying said tobacco stream along said first circular path, and

(b) a second suction wheel, having an air-pervious peripheral surface arranged to travel along a second circular path, a portion of which is adjacent to the peripheral surface of said first suction wheel, and in a direction such that the adjacent portions of said peripheral surfaces of said first and second suction wheels travel in the same direction, for receiving said tobacco stream smoothly and without disturbance from the peripheral surface of said first suction wheel at a second position along said first path downstream of said first position, conveying said tobacco stream along a portion of said circular path and depositing it onto the top surface of said continuous wrapper web,

(c) said spaced confronting surfaces of said stationary side walls extending along one of said circular paths from a location immediately downstream of the position where said tobacco stream is transferred to said one suction wheel to a location adjacent said position where said tobacco stream is transferred therefrom, the other of said suction wheels including a peripheral groove defined by an air-pervious cylindrical bottom wall and spaced side walls projecting radially from opposite sides thereof, the confronting surfaces of said side walls of said other suction wheel being spaced substantially the same distance as the confronting surfaces of said stationary side walls of said one suction wheel.

4,122,860

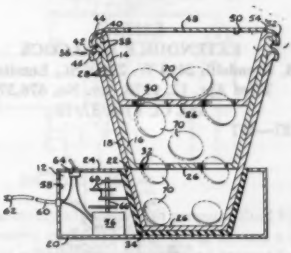
COIN SORTING APPARATUS

Eli Weisman, 6838 N. Ninth St., Philadelphia, Pa. 19126

Filed Jan. 28, 1977, Ser. No. 763,351

Int. Cl.[2] G07D *3/10*

U.S. Cl. 133—3 B **7 Claims**



1. A coin sorting apparatus comprising in combination:

a plurality of nestling cup-like members, each having sidewalls and a base portion, each of said plurality of nestling cup-like members dimensioned to be partially co-extensively inserted in an adjacent one of said plurality of nestling cup-like members, each of said plurality of nestling cup-like members except one having a group of similarly sized apertures located in said base portion thereof, said groups of apertures being progressively graduated in size;

a housing for resting on a supporting surface, said housing having an open-ended chamber located therein, said open-end chamber opening through the uppermost surface of said housing, said open-ended chamber dimensioned to accept the insertion therein of said nestling cup-like member not having one of said groups of apertures located therein;

a cup shaped semi-resilient member, said semi-resilient member disposed within said open-ended chamber of said housing, said semi-resilient member for capturing and frictionally retaining one of said cup-like members when inserted therein; and

means for vibrating said plurality of nestling cup-like members, said vibrating means disposed within said housing.

4,122,861

PUMP SUPPORT AND FLUID DEFLECTOR ASSEMBLY FOR PARTS WASHING MACHINES

Edward Lee, Winnipeg, Canada, assignor to Solv-X Inventions Ltd., Winnipeg, Canada

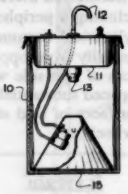
Filed Jun. 27, 1977, Ser. No. 810,488

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—109 **8 Claims**

1. In a solvent type parts cleaner which includes a sink, a solvent container below said sink and drain means in said sink for draining solvent from said sink into said container; a combination pump-and-motor-support and primary separator component in said container, said component including an upper, solvent receiving portion and an outwardly and downwardly

sloping wall portion to deflect solvent from said drain means, outwardly towards the wall of said container, means for solvent to enter the interior of said component from said container, said pump and motor unit including a pump intake situated above said pump and motor unit whereby said pump and motor unit remains submerged in the solvent in said container.

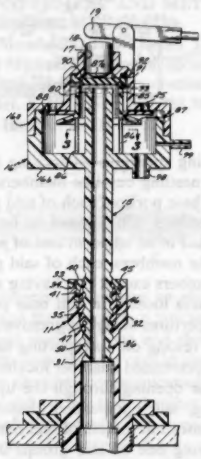


4,122,862

EXTENDIBLE BALLCOCK

Anthony R. Brandelli, 2418 W. 256th St., Lomita, Calif. 90717

Filed Apr. 12, 1976, Ser. No. 676,375
Int. Cl. F16k *31/18*
U.S. Cl. 137—437 **7 Claims**



1. A pressure sealing assembly of a pipe extendibly received in a through fitting comprising, in combination:

a pipe having a helically threaded peripheral segment proximate the lower end thereof, the thread contour of said peripheral segment being rounded on both the high and low extremities thereof;

an annular elastomeric seal having an exterior surface shaped in the manner of a longitudinal segment of an elliptic body of revolution and a substantially concentric interior surface conformed to receive a section of said peripheral segment on said pipe;

a through fitting having a first interior cavity proximate the upper end thereof conformed to partly receive the exterior surface of said seal, a second interior cavity extending axially from said first interior cavity into the interior of said fitting, said second cavity having an interior peripheral surface conformed to the thread contour of said peripheral segment and receiving said segment of said pipe; and

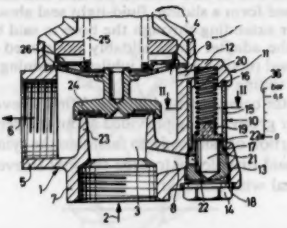
compression means securable to said upper end of said fitting and including a third interior cavity conformed to partly receive the exterior surface of said seal for compressing said seal therebetween.

4,122,863

DIFFERENTIAL PRESSURE OVERFLOW VALVE

Bernard W. Braukmann, Mosbach, Fed. Rep. of Germany, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Jun. 7, 1976, Ser. No. 693,344
Int. Cl.² F16K *37/00*
U.S. Cl. 137—557 **2 Claims**



1. A differential pressure overflow valve having a housing, an inlet and an outlet to said housing, an inlet and outlet pressure chamber in said housing connected respectively to said inlet and outlet, a valve seat in said housing between said inlet and outlet chambers, a flexible diaphragm in said outlet pressure chamber attached to said housing, a valve plate supported by said diaphragm, a first spring bearing on said diaphragm and biasing said valve plate against said valve seat to effect closure of the latter, a differential pressure indicator in said housing, said indicator having a cylinder, a first passage connecting said inlet pressure chamber to said cylinder, a second passage connecting said outlet chamber to said cylinder, a piston in said cylinder and spaced therefrom to provide an annular gap, stop means in said cylinder for said piston located between said first passage and said piston, a second spring acting on said piston to bias the latter against said stop means, said cylinder being in the form of a transparent tube carrying a scale, a lift on said piston due to pressure exerted thereon through the first passage indicating the differential pressure between said inlet and outlet, the cross sectional area of said annular gap being substantially smaller than the total cross sectional area of said first and second passages to provide a choke effect.

4,122,864

SELECTIVE AND PROPORTIONAL HYDRAULIC REMOTE CONTROL DEVICE, IN PARTICULAR FOR HANDLING AND PUBLIC WORK GEARS

Maurice Tardy, Joly-Saint-Etienne, and Jean Paulet, Reclus-Saint-Etienne, both of France, assignors to Bennes Marrel, Saint-Etienne, France

Continuation of Ser. No. 659,784, Feb. 20, 1976, abandoned, which is a division of Ser. No. 542,173, Jan. 20, 1975, Pat. No. 4,044,795. This application Aug. 8, 1977, Ser. No. 822,773
Claims priority, application France, May 31, 1974, 74 19652
Int. Cl.² F15B *13/042, 13/08*
U.S. Cl. 137—625.6 **1 Claim**

1. A fluid control device comprising, in combination:

two fluid emitters which are substantially identical, each said emitter including body means and piston means;

said body means including a first port, a second port, and a third port;

a source of fluid operably connected to said fluid emitters;

said piston means being mounted in said body means for displacement therein;

said piston means being normally biased to a first position so that the first port, through which fluid from said source of fluid may be introduced into said fluid emitter, is closed, while the fluid which may flow from the third port is permitted to leave said fluid emitter through said second port;

said piston means being movable by an external force to a second position so that fluid from said source of fluid

which is introduced into said fluid emitter through said first port is permitted to leave said fluid emitter through said third port, while the second port is closed;

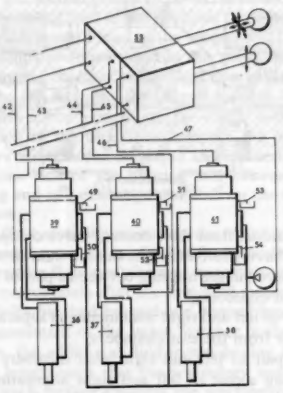
said piston means being provided with control means for varying the effective fluid communication passageway between said first port and said third port;

a distributor provided with two ports which are alternatively inlet and outlet ports, each of said two ports being connected to one of said third ports of said two fluid emitters;

said fluid emitters allow in particular the admission of the fluid sent under low pressure toward said distributor connected to said fluid emitters through an inlet port of said distributor, wherein said distributor is adapted to control operation of power members, such as jacks or the like;

said control means of one of said emitters adjusts the pressure to the inlet port of said distributor, while the pressure of an outlet port of said distributor is constant;

said control means which adjusts the pressure of the inlet port of said distributor are grouped inside said fluid emitter;



said fluid emitter includes a body provided with at least one hollow piston which slides inside an axial bore in said body;

said control means includes calibrated holes drilled in a radial direction in said piston;

said two fluid emitters being alternatively manually operated by means of a control lever;

the position of said control lever defines the number of said calibrated holes being obturated, the unobturated holes defining a section of said inlet port by opening in a chamber of pressure;

said distributor having a slide valve with two opposite end faces, and each port of said distributor opens in a chamber in which is located one of said two opposite end faces of said slide valve;

said slide valve including a hole along its longitudinal axis extending from one of said end faces to the other of said end faces of said slide valve; and

said hold being provided with a jet through which a controlled flowing out of said fluid set under low pressure takes place.

4,122,865

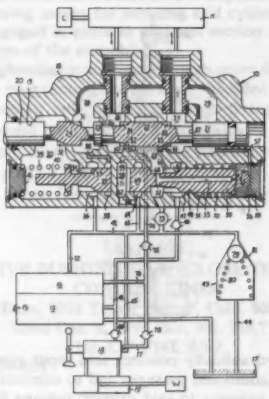
LOAD RESPONSIVE FLUID CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 729,696, Oct. 5, 1976, Pat. No. 4,028,889, and Ser. No. 655,561, Feb. 5, 1976. This application Feb. 28, 1977, Ser. No. 773,421

Int. Cl.[2] F15B *13/02*

U.S. Cl. 137—596.13 **14 Claims**



1. A valve assembly supplied with pressure fluid by a pump, said valve assembly comprising a housing having a fluid inlet chamber, a fluid supply chamber, first and second load chambers, load pressure sensing means operable to transmit a control signal to said pump, and fluid exhaust means, first valve means for selectively interconnecting said fluid load chambers with said load pressure sensing means, said fluid supply chamber and said fluid exhaust means, variable metering orifice means responsive to movement of said first valve means and operable to throttle fluid flow between said fluid supply chamber and said load chambers, outlet fluid throttling means between said load chambers and said fluid exhaust means on said first valve means, second valve means having inlet fluid throttling means between said fluid inlet chamber and said fluid supply chamber responsive to pressure differential across said variable metering orifice means, said second valve means having inlet fluid isolating means between said fluid inlet chamber and said fluid supply chamber, said inlet fluid isolating means having means responsive to pressure upstream of said outlet fluid throttling means, and fluid replenishing means operable to supply fluid flow from said fluid exhaust means to one of said load chambers which is not pressurized when said fluid isolating means isolates said fluid supply chamber from said fluid inlet chamber.

4,122,866

CONTROL VALVE FOR POWER CYLINDER OF STEERING GEAR

Floyd A. Schluckebier, Vassar, Mich., assignor to General Motors Corporation, Detroit, Mich.

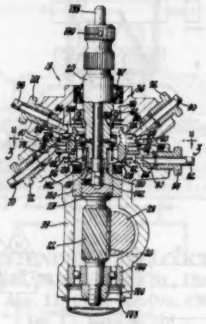
Filed Apr. 7, 1977, Ser. No. 785,597

Int. Cl.[2] F15B *9/1*

U.S. Cl. 137—625.27 **4 Claims**

1. A hydraulic control valve for a power steering unit comprising a valve housing, a manual input shaft mounted for limited rotary movement in said valve housing, a linearly movable valve element disposed around said input shaft mounted in said housing, said housing having an input passage for supplying pressure fluid to said valve element, an exhaust passage for exhausting fluid from said valve element and a pair of additional passages for right and left turn power steering, lever means supported within said housing and on said valve element for mechanically interconnecting said input shaft to

said valve element for shifting said valve element in a first linear direction in response to the turning of said input in a first rotary direction to thereby operatively connect the input passage to a first of said additional passages and to further connect the second of said additional passage to said exhaust passage for powered right turn steering, said lever means being acutated to shift said valve element in an opposite linear direction in response to the turning of said input shaft in a second rotary



direction to hydraulically connect said input passage to the second of said additional passages and to connect the first of said additional passages to said exhaust passage for powered left turn steering and spring means operatively connecting said input shaft to said valve element to center said valve element in a position whereby an input pressure fed to said input passage is operatively connected to said exhaust passage when turning effort exerted on said input shaft is terminated.

4,122,867

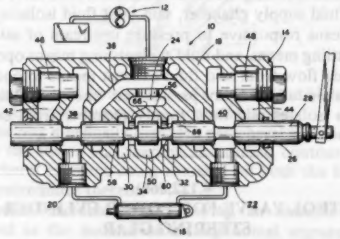
HYDRAULIC VALVE WITH OPEN CENTER METERING NOTCHES

Joseph L. Zagotta, Chicago, Ill., assignor to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 538,685, Jan. 6, 1975, abandoned, and Ser. No. 365,648, May 31, 1973, abandoned. This application Jun. 9, 1977, Ser. No. 805,245

Int. Cl.² F16K *47/04*

U.S. Cl. 137—625.3 **10 Claims**



1. In a control valve comprising a valve body having a circular bore, a spool reciprocable along its longitudinal axis within the circular bore, the circular bore having an enlarged diameter portion forming a bore land, the spool having a reduced diameter portion forming a cylindrical spool land, the spool land having a flat radial surface adjacent the reduced diameter portion for controlling fluid flow passing across the bore land upon movement of the spool land in opposite axial directions to and from the bore land, means forming a throttling slot in the spool land, the throttling slot having a wall portion axially spaced from the flat radial surface of the spool land and extending radially outwardly from the reduced diameter portion to the cylindrical peripheral surface of the spool land, the throttling slot including a cavity means formed in the spool land extending radially inwardly from the reduced diameter portion toward the longitudinal axis of the spool, the cavity means having a first wall surface disposed axially from the flat radial surface of the spool land and extending perpendicular relative to the longitudinal axis of the spool, the cavity means further having a second wall surface extending perpendicular to the longitudinal axis of the spool and axially spaced from the first wall surface, the first and second wall surfaces parallel to and coinciding respectively with the wall portion of the throttling slot and the flat radial surface of the spool land.

4,122,868

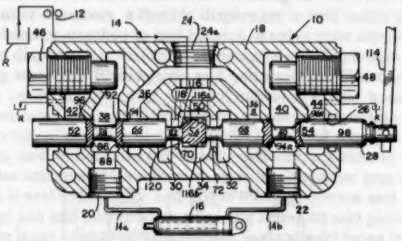
HYDRAULIC VALVE ASSEMBLY HAVING AN AXIAL FLOW FORCE BALANCED SPOOL

Gale A. Holloway, Joliet; Rudolph Yeh, Elmhurst, and Joseph L. Zagotta, Chicago, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation of Ser. No. 544,030, Jan. 24, 1975, abandoned, and a continuation-in-part of Ser. No. 365,649, May 31, 1973, abandoned. This application Jan. 24, 1977, Ser. No. 761,758

Int. Cl.² F15B *13/04*; F16K *11/07*

U.S. Cl. 137—625.69 **8 Claims**



1. A directional fluid flow control valve comprising:

a housing having left and right sides, a fluid flow inlet chamber centered in the housing between a pair of left and right fluid exit chambers;

a first pair of left and right wall members separating the inlet chamber from the exit chambers;

a second pair of left and right wall members respectively separating a pair of left and right alternating fluid flow input chambers from a pair of left and right alternating fluid flow receiving chambers; and

a third pair of left and right wall members respectively separating a pair of left and right alternating fluid discharge chambers from the pair of alternating fluid flow receiving chambers;

the three pairs of wall members having an axially extending cylindrical bore therethrough respectively forming first, second and third pairs of fluid flow control lands in the wall members; and

a cylindrical valve member slidably carried in the bore and having a central fluid flow position between a fluid flow left position and a fluid flow right position;

a first pair of axially spaced apart annular flow control grooves in the valve member forming a central spool valve element having left and right control edges located within the inlet chamber in the central fluid flow position and forming a first pair of left and right spool valve elements each having a first control edge respectively located within the left and right exit chambers, the left and right control edges on the central spool valve element respectively facing the first control edges on the first pair of left and right spool valve elements and defining a first pair of facing left and right control edges on opposite axial sides of the central spool valve element adapted to block fluid flow past the first pair of control lands between the inlet and exit chambers as the valve member is axially

moved from the central fluid flow position to either the left or right fluid flow position;

a second pair of axially spaced apart annular fluid flow control grooves in the valve member forming ends of the first pair of left and right spool valve element and starts of a second pair of left and right spool valve elements, the starts of the second pair of spool valve elements having a set of control edges respectively facing a set of control edges on the ends of the first pair of spool valve elements, the two sets of control edges defining a second pair of facing left and right control edges, the ends of the first pair of spool valve elements blocking fluid flow past the second pair of control lands between the input and receiving chambers and the second pair of spool valve members blocking fluid flow past the third pair of control lands between the receiving and discharge chambers in the central fluid flow position, the second pair of facing control edges adapted to open fluid flow past one control land of the second pair of control lands on one side of the housing and to open fluid flow past one control land of the third pair of control lands on the other side of the housing and vice versa as the valve member is axially moved from the central fluid flow position to either the left or right fluid flow position;

first fluid metering means on one set of the first pair of facing control edges and second fluid metering means on both sets of the second pair of facing control edges for providing first and second primary restrictive flows respectively past one control land of the first pair of control lands and past the one control land of the second and third pairs of control lands and vice versa as the valve member is initially moved from the central fluid flow position towards either the left or right fluid flow position for reducing reactionary force exerted on the valve member by the momentum of the fluid flow between the inlet and exit chambers and between one input and one receiving chamber on one side of the housing and between the other receiving and one discharge chamber on the other side of the housing;

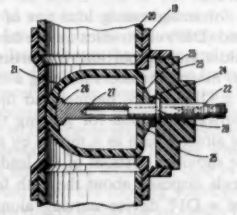
additional fluid metering means on the set of control edges of the center spool valve element for providing a secondary restrictive flow past the one control land of the first pair of control lands after the first fluid metering means is substantially blocked by said one control land upon continued movement of the valve member in the same axial direction, the additional fluid means having a channel of an axial length such that the secondary restrictive flow therethrough further balances the reactionary force produced on the valve member by the momentum of the second primary restrictive fluid flow past the one control land of the second pair of control lands on one side of the housing and past the one control land of the third pair of control lands on the other side of the housing.

4,122,869

CLOSURE PLUG ASSEMBLY

Walter H. Roberson, Sr., 808 Second St., Altamonte Springs, Fla. 32701

Filed Nov. 12, 1976, Ser. No. 741,369
Int. Cl.[2] F16L *55/12*
U.S. Cl. 138—93 18 Claims



1. A closure plug test assembly for the pressure testing of a pipeline in liquid drain and vent systems having a tee or Y-test section with a test opening, said test assembly comprising:

(a) an inflatable body portion;

(b) a rigid holder portion having a hollow stem section and a cylindrical plug section having a structural configuration to engage said test opening,

(c) said hollow stem section havng an end portion which extends in a direction parallel to a longitudinal axis of the pipeline when the test assembly is disposed in the pipeline,

(d) tightening means for securing said cylindrical plug section engaged in place in said test section throughout the operation of the assembly,

(e) said tightening means including an outer threaded surface on said plug section and an inner threaded surface on said test opening into a drain or vent system for threaded engagement with respect to each other,

(f) stem end means for connecting the body portion to the holder portion, and

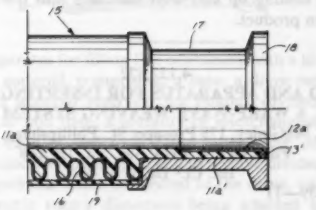
(g) valve means for inflating the body portion.

4,122,870

PROTECTIVE BUSHING TO ENCLOSE THE END OF A CONDUIT LINER

Vernon C. Hines, 1001 Tejon, Denver, Colo. 80204

Filed Dec. 8, 1976, Ser. No. 748,776
Int. Cl.[2] F16L *9/02*
U.S. Cl. 138—109 3 Claims



1. The combination of a uniform diameter conduit along its length having an essentially rigid metal, squared outer end, tubular end member and an elastomeric lining in said conduit terminating closely adjacent the tubular end member, and

(a) a uniform inner and outer diameter, smoothly belled flared end, rigid metal tubular bushing telescoped in said tubular end member, extending about the length of its diameter into said tubular end member and providing an annular space between the exterior of said bushing and the interior of the tubular end member,

(b) the flared end of said bushing being in snug fitting contact with said tubular end member, and

(c) said elastomeric lining being bonded to the interior of said tubular end member, completely filling said annular space and bonded to the exterior of said bushing, so as to provide no void spaces in said elastomeric filled annular space, and the interior diameter of said bushing being of the same interior diameter as the lining so as to form a smooth joint therebetween.

4,122,871

METHOD OF WEAVING AND APPARATUS THEREFOR

Thomas F. McGinley, 175 Prospect St., Phillipsburg, N.J. 08865

Filed Jul. 7, 1976, Ser. No. 703,307
Int. Cl.[2] D03D *47/00*
U.S. Cl. 139—11 82 Claims

1. A method of weaving which comprises the steps of

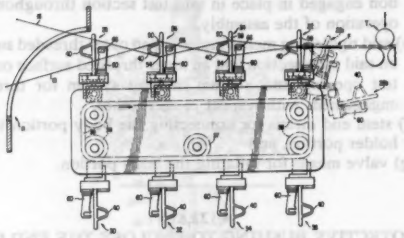
(a) forming a shed of warp members at a first location on a loom,

(b) inserting means into said shed to traverse said warp members and retain said sheds,

(c) moving said shed-retaining means and its associated shed

forwardly along said warp members in a substantially straight plane toward the fell of the woven product while concurrently and successively forming successive sheds at said first location,

(d) concurrently with said forward movement of said retaining means and shed, inserting retaining means successively into successive sheds at said first location to continuously retain one or more sheds having open weft-wise passageways traveling toward the fell of the woven product,



(e) inserting a weft member successively by weft-laying means into each of said sheds formed successively at said first location,

(f) removing said shed-retaining means from its shed-retaining position,

(g) and beating up said weft members into the fell of the woven product.

4,122,872

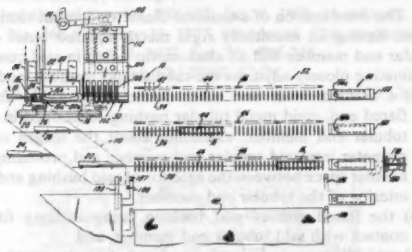
METHOD AND APPARATUS FOR INSERTING WEFT IN A WARP-WAVE WEAVING SYSTEM

Thomas F. McGinley, 175 Prospect St., Phillipsburg, N.J. 08865

Filed Oct. 4, 1976, Ser. No. 729,148

Int. Cl.² D03D *47/00*

U.S. Cl. 139—11 **67 Claims**



1. In a weaving loom utilizing a plurality of moving warp sheds, wherein the sheds move in the direction of the warp threads so that said sheds move in a longitudinal direction, the method of supplying and laying weft threads in each of said moving sheds comprising the steps of:

moving a gripper shuttle into a loading area on at least one side of said moving warp sheds,

supplying weft thread to said loading area from a plurality of stationary weft supply packages,

said gripper shuttle operating to grip said weft thread,

firing said gripper shuttle with the gripped weft thread through one of said moving warp sheds, said gripper shuttle being unconnected to said loom during its traversal through said one of said moving warp sheds, and

receiving and stopping said gripper shuttle at a receiving area on the other side of said moving warp sheds,

whereby weft thread is laid in said one of said moving warp sheds during the entire time said gripper shuttle traverses said moving warp shed.

4,122,873

CONTROL MEANS FOR CONTROLLING THE WARP LET-OFF OF A WEAVING MACHINE

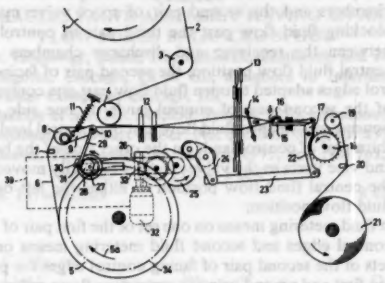
Erwin Pfarrwaller, Winterthur, and Eberhard Seifert, Sulz-Attikon, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 26, 1977, Ser. No. 836,359

Claims priority, application Switzerland, Sep. 27, 1976, 12184/76

Int. Cl.² D03D *49/10*

U.S. Cl. 139—110 **18 Claims**



1. In a weaving machine, the combination comprising

a machine drive;

a warp beam drive for rotating a warp beam in an incremental motion; and

a control means for controlling said warp beam drive, said control means including

a movably mounted detector responsive to a change in warp tension,

a pulse transmitter adapted to move in synchronism with a weaving cycle of said machine drive and in relative relation with said detector,

at least one sensing surface of variable shape on one of said detector and transmitter, and

a sensing element on the other of said detector and transmitter disposed to travel over said sensing surface to emit a pulse to said warp beam drive for stepping said warp beam, said pulse corresponding to the operative distance which said sensing element travels over said sensing surface whereby said pulse is variable in time-of-occurrence and in duration.

4,122,874

APPARATUS FOR STRAIGHTENING THE LEADS OF DUAL IN-LINE PACKAGES

Clifford Alan Tyner, 73 Peter, Campbell, Calif. 95008, and Dean Lee Westbrook, 377 Jai Dr., San Jose, Calif. 94086

Filed Jun. 14, 1976, Ser. No. 695,750

Int. Cl.² B21F *1/02*

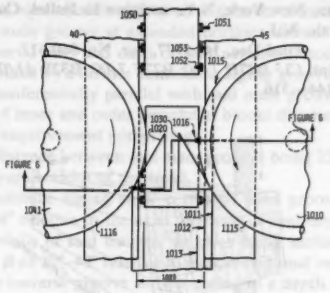
U.S. Cl. 140—147 **12 Claims**

1. Apparatus for straightening lead tips of a moving Dual In-Line Packaged (DIP) electronics device having a body and leads with shoulder and tip portions comprising:

guiding means having members forming a channel disposed to receive a DIP device having lead tips oriented in a generally upward position for guiding the body of the DIP device along a path as it moves by applying biasing force to the shoulder portions of the leads;

a pair of wheels disposed about the path for engaging the lead tips of a DIP device moving along the path and bending the lead tips toward the center of the path as the DIP device moves along the path; and

biasing means disposed along the path for bending the lead tips of a DIP device away from the center of the path by



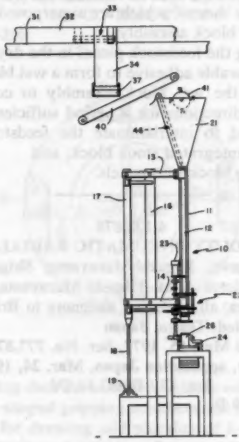
applying a bias force to the tips as the DIP device moves along the path.

4,122,875

CAN FILLING APPARATUS AND METHODS AND APPARATUS AND METHODS FOR CONVEYING AND CONTROLLING THE FEEDING OF WET MATERIALS

Edward E. Ross, San Rafael, Calif., assignor to Del Monte Corporation, San Francisco, Calif.

Filed Mar. 30, 1977, Ser. No. 782,924
Int. Cl.[2] B65B *1/08*
U.S. Cl. 141—11 **10 Claims**



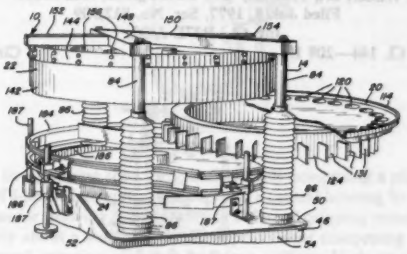
10. In a method for conveying wet material and for introducing measured amounts of such material into cans, the method making use of an upright tube having its upper open end communicating with a feed hopper for receiving moist material and having means at the lower end of the tube for continually severing measured amounts of the material, a conveyor belt being employed for moving the wet material in one direction to a region at a level above the upper end of the tube, the method comprising diverting wet material from one side of the conveyor belt, receiving the diverted material in an upright surge hopper, feeding the wet material from the lower end of the surge hopper to the region above the feed hopper and then dropping the material into the feed hopper whereby a column of the material is maintained within the tube in which the wet material is diverted from the moving conveyer belt by positioning at least two rollers across the upwardly faced run of the conveyer with the rollers being in parallel relationship and in close juxtaposition with the lowermost roller being in contact with the upper surface of the conveyer belt, the rollers extending at an angle across the conveyer belt that is less than 90° to form a barrier extending across the conveyer, and driving the rollers in the same direction of rotation, the direction of rotation being such that the lower peripheral surface of the lowermost roller turns in a direction opposite to the direction of movement of the conveyer belt.

4,122,876

APPARATUS FOR FILLING CONTAINERS

John C. Nalbach, La Grange Park, Ill., assignor to John R. Nalbach Engineering Co., Inc., Chicago, Ill.

Filed Sep. 30, 1977, Ser. No. 838,311
Int. Cl.[2] B65B *43/50*
U.S. Cl. 141—150 **14 Claims**



1. An apparatus for filling like containers with a like amount of divided material, comprising: a base; a drive mounted on said base; a material reservoir for holding divided material connected to said base; a plurality of interchangeable rotary dispensers, each of said rotary dispensers being adapted for driving connection to the drive and to receive divided material from the reservoir when connected to the drive, each of said interchangeable rotary dispensers being adapted to receive removably a container of a given size different from the size container receivable by each of the other rotary dispensers of the plurality, each interchangeble rotary dispenser having a circular portion having a plurality of radially mounted vanes on its outer periphery and being spaced an equal distance from adjacent vanes on the circular portion, each of said vanes being relatively thin at its outer edge, the vanes of each of the interchangeable rotary dispensers being spaced apart from each other a distance sufficiently great to receive a container of a given size different from the container received between the vanes of each of the other interchangeable rotary dispensers of the plurality to hold the containers in a portion of a circle, a filler tube positioned between each pair of vanes, each of the filler tubes of one rotary dispenser being identical to each other filler tube of that rotary dispenser and different than the filler tubes on each of the other rotary dispensers of the plurality, each of said filler tubes being adapted to deliver a predetermined amount of divided material into a container of a given size held between its respective vanes, a selected one of said interchangeable rotary dispensers being drivingly connected to the drive and being rotatably positioned below the material reservoir to rotate relative to the material reservoir to receive said divided material into its respective filler tubes from the material reservoir while the remainder of the rotary dispensers of the plurality are disposed in an inoperative attitude; and a feed connected to the base to deliver empty like-sized containers to the selected rotary dispenser connected to the drive, whereby said selected one of said rotary dispensers being drivingly connected to the drive below the material reservoir to receive a maximum number of containers of a given size may be disconnected from the drive and removed from below the material reservoir and replaced by another one of the plurality of rotary dispensers to be connected to the drive below the

material reservoir to receive a maximum number of containers of another size.

4,122,877

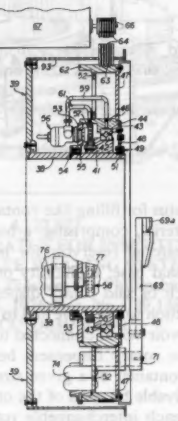
RING TYPE DEBARKER

Bob R. Smith, 445 Sun Valley Rd., Birmingham, Ala. 35215; Harold L. West, Rte. 1, Box 297, Leeds, Ala. 35094; Thomas L. Bray, 452 Crest Dr., Birmingham, Ala. 35209, and Robert H. Wilder, Sr., 1141 Lay Dr., Birmingham, Ala. 35215

Filed Jul. 5, 1977, Ser. No. 812,909

Int. Cl.² B27L *1/00*

U.S. Cl. 144—208 E **5 Claims**



1. In a ring type debarker,

(a) a centrally disposed tube-like support member with its longitudinal axis lying substantially horizontally and having an internal diameter sufficient to permit logs to be fed into an infeed end thereof and discharged from an outfeed end thereof,

(b) means connected to the support member adjacent the outfeed end thereof for supporting the same,

(c) a debarker arm carrying member mounted for rotation relative to the support member,

(d) a plurality of debarker arms pivotally mounted on the arm carrying member adapted to engage and debark a log while passing through the support member,

(e) fluid pressure responsive operators associated with each of said arms effective when pressurized to bias the arms into debarking contact with a log passing through the apparatus,

(f) a pump for supplying fluid under pressure to said fluid pressure responsive means, said pump being mounted on and rotatable with the arm carrying member,

(g) an annular gear associated with the support member and having its teeth on the outer circumference thereof,

(h) a pinion carried by the pump and meshing with said gear, whereby rotation of the pump with the arm carrying member drives the pump,

(i) a belt sheave on the outer surface of the arm carrying member, and

(j) a motor and belt operative through said sheave to rotate the arm carrying member.

4,122,878

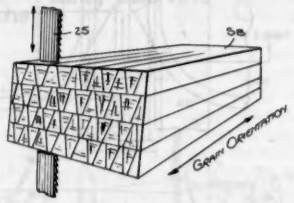
TECHNIQUE FOR CONVERTING BALSA LOGS INTO PANELS

Jean Kohn, New York, N.Y., assignor to Baltek Corporation, Northvale, N.J.

Filed Dec. 14, 1977, Ser. No. 860,617

Int. Cl.² B27D *1/00*; B27F *7/00*; B32B *31/00*

U.S. Cl. 144—316 **14 Claims**



1. A high yield technique for converting logs of different diameter into large rectangular panels, said technique comprising the steps of:

A. radially cutting each log into a plurality of sectors having the same apex angle;

B. longitudinally cutting each sector both at its apex and at its arc to form a truncated feedstock piece whose cross-sectional geometry is that of an isosceles trapezoid, all feedstock pieces having the same base angles and a variable width depending on the diameter of the logs from which they are derived;

C. fitting together pieces in a complementary manner to create layers thereof which are superposed in a stack to define a dry block assembly;

D. wet-coating the feedstock pieces in the dry block assembly with a curable adhesive to form a wet block assembly;

E. subjecting the wet block assembly to compression in orthogonal directions for a period sufficient to cure the adhesive and to interlaminate the feedstock pieces to produce an integrated stock block; and

F. dividing the block into panels.

4,122,879

HEAVY DUTY PNEUMATIC RADIAL TIRE

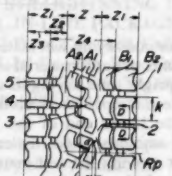
Hiroyoshi Takigawa, Higashi-Murayama; Shigeo Watanabe, Kokubunji; Shigeta Aoki, Higashi-Murayama, and Hiroshi Ogawa, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,875

Claims priority, application Japan, Mar. 24, 1976, 51-32128

Int. Cl.² B60C *11/04*

U.S. Cl. 152—209 R **10 Claims**



1. In a heavy duty pneumatic radial tire having an all-weather type tread pattern formed in a tread divided into a central zone and peripheral zones on both sides thereof by two main, continuous, circumferential zigzag grooves formed on both sides of an equatorial line of the tire, said central zone comprising a plurality of central blocks disposed in two rows divided by segment grooves along said equatorial line and a

number of dividing grooves extending between said main grooves, each of said peripheral zones being circumferentially divided into blocks in the form of arrow feathers directed toward said equatorial line by traverse grooves communicating with said main groove at extended portions thereof opposite said equatorial line, and each of said peripheral zones being further divided by a further continuous zigzag groove substantially circumferentially parallel with said main grooves into a plurality of inner and outer peripheral blocks disposed in two rows, the improvement comprising:

(a) the distance between said main grooves being 25–38% of the overall width of the tread,

(b) the oblique zigzag angle α of said main grooves being 55°–78° relative to the axial direction of said tire,

(c) the walls of said traverse grooves being inclined at an angle β of 20°–40° relative to a cross-sectional center line of the traverse groove and extending to a depth from the outer surfaces of said blocks of at least 20% of the depth of said traverse grooves,

(d) the ratio of total area of the blocks in said central zone to that in one of said peripheral zones being 1:1.0 to 1:1.5, and

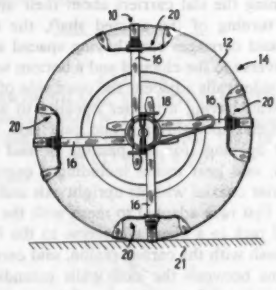
(e) the ratio of the total areas of said inner and outer peripheral blocks being 1:1.5 to 1:2.5.

4,122,880

AUXILIARY GRIPPING MEMBERS FOR GRIPPING SHOES FOR VEHICLE WHEELS

Egil Hyggen, Oslo, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Mar. 30, 1977, Ser. No. 782,828
Claims priority, application Norway, Apr. 7, 1976, 761185
Int. Cl.² B60C *27/04*
U.S. Cl. 152—216 **6 Claims**



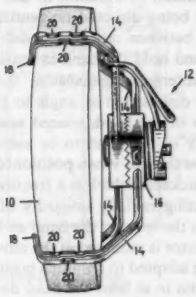
1. In a gripping shoe assembly for vehicle wheels comprising a plurality of J-shaped gripping members and a central housing having means for drawing said plurality of J-shaped gripping members snugly about a vehicle tire, each said J-shaped member comprising a long leg and a short leg and a traction member connecting said long leg and said short, the improvement comprising an auxiliary gripping member attached to at least one said J-shaped gripping member, said auxiliary gripping member comprising at least two traction members and a connecting member therebetween, a U-shaped member attached to approximately the center of said connecting member, a slot in said U-shaped member, said long leg fitting into said slot, the ends of said slot bearing against a first face of said long leg and part of said U-shaped member projecting past the second face of said long leg, a plurality of alternating corrugations on both faces of said long leg, the ends of said slot being placed against the corrugations on the first face of said long leg and affixed there by means of a pin-like member which passes between the second face of the long leg and the U-shaped member, said pin engaging at least one of said corrugations on the second face of said long leg to fixedly position the auxiliary gripping member.

4,122,881

GRIPPING SHOES FOR VEHICLE WHEELS

Egil Hyggen, Oslo, Norway, assignor to Elkem-Spigerverket A/S, Oslo, Norway

Filed Mar. 30, 1977, Ser. No. 782,827
Claims priority, application Norway, Apr. 7, 1976, 761184
Int. Cl.² B60C *27/04*
U.S. Cl. 152—216 **1 Claim**



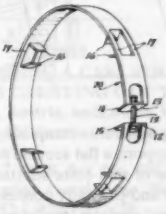
1. In a gripping shoe for vehicle wheels comprising a plurality of J-shaped gripping members and a central housing having means for drawing said plurality of J-shaped gripping members snugly about a vehicle tire, the improvement comprising said J-shaped gripping members having a uniform U-shape cross section throughout their length with the legs of said U-shape cross section protruding outwardly, the legs of said U-shape cross section at least in the area of said gripping member which engages the ground being wavy and the waves on one leg of the U-shape cross section being offset from the waves on the other leg of the U-shape cross section being offset from the waves on the other leg of the U-shape cross section whereby sideways sliding is resisted.

4,122,882

WHEEL RIM

Peter M. Fisher, Semington, and James A. Matsumiya, London, both of England, assignors to TSB International N.V., Curacao, Netherlands Antilles

Continuation of Ser. No. 572,627, Apr. 28, 1975, abandoned.
This application Nov. 22, 1976, Ser. No. 744,156
Int. Cl.² B60B *21/00*
U.S. Cl. 152—381.2 WC **7 Claims**



7. An obstructor for a wheel rim having an axis, a cylindrical base coaxial with the axis of the rim and having a predetermined diameter, an annular flange extending outwardly from each axial side of the base, spaced-apart annular seats for respective beads of an inextensible bead tubeless pneumatic tire on the base respectively adjacent each flange, an annular well in the base axially between the bead seats and projecting radially inwardly of the bead seats, the well being any one of a plurality of different size wells in a said rim and having side walls and a well base the dimensions of which determine the size of the well, being adapted to obstruct any one of a plurality of different size wells in wheel rims having a cylindrical base of

a substantially common diameter, the obstructor comprising a band having an axial width less than the distance between the bead seats and ends disposed adjacent one another, the band being of inextensible material and having a thickness which is a fraction of the depth of the well, the band being positionable around the rim to lie at the mouth of the well and extending across the well and free of the bead seats, the obstructor further comprising retaining means independent of the presence, position or condition of inflation of any tire on the rim, the retaining means being directed tangentially to the axis of the rim and acting between adjacent ends of the band to draw them together and hold the band in tension positively against radial or circumferential expansion, the obstructor further comprising lugs disposed at an angle to the band and directed along the width of the band, spaced apart from one another circumferentially of the band to be substantially opposed to each other across the rim when positioned around the rim, the lugs having a thickness which is a fraction of the depth of the well and projecting radially inwardly of the band and lying radially between the level of the band and the level of the base when the obstructor is mounted at the mouth of the well, edges of the lugs being adapted to delimit a position of the obstructor relative to the rim in at least the axial direction, whereby the band is adapted to be held coaxially with the rim at the mouth of any one of a plurality of different size wells in a wheel rim having a cylindrical base of a substantially common predetermined diameter, to deny access to any substantial part of the circumferential length of the well to the beads of any tire on the rim.

4,122,883

TIRE FITTING APPARATUS

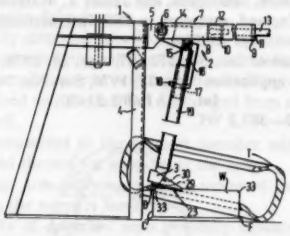
John F. Askam, Sutton Coldfield, England, assignor to Dunlop Limited, England

Continuation of Ser. No. 563,829, Mar. 31, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,922

Claims priority, application United Kingdom, Apr. 6, 1974, 15364/74

Int. Cl.² B60C *25/06*

U.S. Cl. 157—1.17 **7 Claims**



1. A tire fitting apparatus comprising: force applying means connected to a support, a flat arcuate plate and a shank extending from one side of said plate substantially perpendicular to the plane thereof and pivotally connected to said force-applying means, two end surfaces, one at each end of the plate, and a central surface disposed between said two surfaces being provided on the other side of the plate, the two end surfaces being co-planar, the common plane being parallel to and spaced apart from the plane of the central surface and being further from said one side than the plane of the central surface, and a surface for engagement with a wheel rim said surface being inclined to the length of the shank, the direction of inclination being such that a part of the surface further from the plate is nearer to the center of curvature of an edge of the plate in a radial sense than a part of the surface nearer to the plate said surface being on the shank and generally facing said center of curvature.

4,122,884

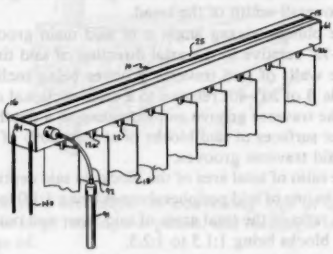
VERTICAL VENETIAN BLIND CONSTRUCTION

Ferdinand F. Salzmann, Middleton, Wis., assignor to Consolidated Foods Corporation, Chicago, Ill.

Filed Jan. 24, 1977, Ser. No. 762,197

Int. Cl.² E06B *9/30*

U.S. Cl. 160—168 R **17 Claims**

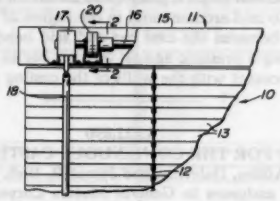


1. In a vertical venetian blind closure of the type including a horizontal carriage guide channel having an opening along one side, a plurality of carriages mounted on the guide channel for movement therealong, a slat carrier mounted on each of said carriages for rotation relative thereto about an upright carrier axis, a splined shaft extending lengthwise of said channel, and gear means on each of said carriages engaging said splined shaft for turning the slat carriers about their upright axes in response to turning of the splined shaft, the improvement comprising: said carriages each having spaced side walls extending transverse to the channel and a bottom wall extending between the side walls adjacent the open side of the channel, the bottom wall having a carrier opening to allow the slat carrier to extend therethrough and said side walls having aligned shaft openings for the passage of said splined shaft therethrough, said gear means including a carrier pinion on each slat carrier coaxial with its upright axis and a rack member having a first rack adapted to mesh with the splined shaft and a second rack in a plane transverse to the first rack and adapted to mesh with the carrier pinion, said carriages having passage means between the side walls extending from the bottom wall and opening at the top of the carriage, said passage means being shaped to allow insertion of the slat carrier and rack member as a subassembly into the carriage from the top thereof and to laterally retain the rack member with the second rack in meshing engagement with the carrier pinion during and after insertion of the subassembly into the carrier, said carrier opening being non-circular and said slat carrier having a non-circular end portion adapted to be slidably and non-rotatably received in said carrier opening in a preselected angular position and an intermediate portion between the end portion and the carrier pinion dimensioned to allow rotation of the slat carrier after it is inserted in the carriage, said passage means having upright wall portions intermediate said side walls and engageable with the ends of the rack member to longitudinally position the rack member during insertion into the carriage, and said upright wall portions having their lower ends spaced above said bottom wall to allow lengthwise reciprocation of the rack member after it is inserted in the carriage, and each slot carrier and rack members having interengaging means for inhibiting relative movement of the rack member and slat carrier in a direction paralleling the slat carrier axis during and after insertion of the subassembly into carrier.

4,122,885
VENETIAN BLIND TILTER CLUTCH

Anthony F. Marotto, Philadelphia, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Filed Nov. 7, 1977, Ser. No. 849,415
Int. Cl.[2] E06B 9/26
U.S. Cl. 160—176 R 9 Claims

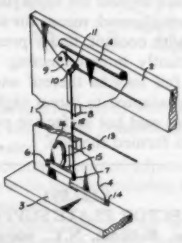


1. The combination with a venetian blind including a rotary tilt rod for tilting slats and operating means for rotating said tilt rod, of coupling means interposed between said operating means and tilt rod, said coupling means comprising a drive element nonrotatably connected to said operating means for rotation therewith, a driven element nonrotatably connected to said tilt rod for rotation with the latter, separable interfitting formations on said drive and driven elements configured to effect driving engagement and urging said formations apart when in their interfitting relation and driving engagement, and resilient spring clip means of predetermined spring constant embracingly astride said drive and driven elements and urging said formations toward their interfitting relation, for driving said tilt rod by said operating means at a less than predetermined value of tilt rod resistance and disengaging said tilt rod from said operating means at a tilt rod resistance greater than said predetermined value.

4,122,886
WINDOW SHADE TIE-DOWN SYSTEMS

Allen H. Marangoni, 3661 N. Decatur Rd., Decatur, Ga. 30031

Filed Feb. 17, 1977, Ser. No. 769,719
Int. Cl.[2] E06B 9/20
U.S. Cl. 160—269 3 Claims

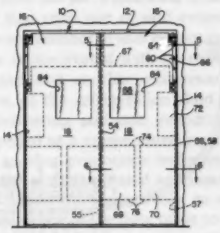


1. A tie-down system for holding the top and side edges of a shade to the top and sides of a window frame and with said tie-down system comprising a pair of brackets mounted to opposed upper corners of the window frame with portions of said brackets bearing cord guides overlaying the side of the shade distal said frame; a pair of clasps mounted to opposed lower corner of the window frame aside and straddling the shade; a pair of swing arms pivotably mounted to opposed lower corner of the window frame overlaying the side of said shade distal said window frame for movement into and out of locking engagement with said clasps; and flexible cord means extending between said swing arms through said pair of bracket cord guides.

4,122,887
FLEXIBLE CURTAIN

Edmund J. Dussault, Shirley; August J. Kochis, Concord, and Arthur A. Cross, Arlington, all of Mass., assignors to Eckel Industries, Inc., Cambridge, Mass.

Filed May 24, 1977, Ser. No. 799,949
Int. Cl.[2] A47H 23/00
U.S. Cl. 160—354 8 Claims



1. A closure apparatus comprising:
a vertical post;
means for rotatably mounting said post;
a first split sleeve coaxially mounted on said post so as to rotate therewith;
a second split sleeve positioned at right angles to said post and mounted to rotate therewith;
each of said sleeves including a pair of substantially parallel flanges, each of said flange pairs being substantially coextensive in length with its corresponding sleeve;
a flat bracing panel including first and second mutually perpendicular edges positioned between the flanges of said first and second sleeves respectively, said panel edges being at least partially coextensive with the length of the corresponding flange pairs, said flange pairs being fastened to said panel at spaced points along said edges;
a curtain including a pliant material folded on itself into at least a pair of layers and terminating in a pair of free edges opposite the fold of said material substantially parallel to said post;
said layers being formed into a pocket closed at the top and open at said free curtain edges and adapted to receive said second sleeve and said flat bracing panel;
said curtain being disposed so that said second sleeve and said bracing panel extend into said pocket; and
cooperating snaps disposed on said free curtain edges for removably fastening said free curtain edges around said first sleeve and said post.

4,122,888
METHOD OF GUIDING A CAST STRAND AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Othmar Pühringer, Linz, Austria, assignor to Vereinigte Österreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Linz, Austria

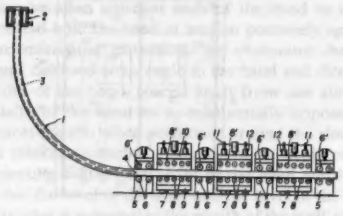
Filed Apr. 27, 1976, Ser. No. 680,752
Claims priority, application Austria, Apr. 30, 1975, 3321/75
Int. Cl.[2] B22D 11/128
U.S. Cl. 164—82 6 Claims

1. In a method of guiding a cast strand which is extracted from a mold and is horizontally deflected toward a horizontal guiding path when still having a liquid core by using pairs of opposing driving rollers that are pressure-adjustable to the surface of the strand and by using pairs of opposing supporting rollers having a distance therebetween that is adjustable by form-locking connection means, the improvement comprising the step of releasing the form-locking connection means between the pairs of supporting rollers from a place in the horizontal guiding path where the strand has entirely solidified to the end of said guiding path so that the strand is only supported by the supporting rollers on its lower side while the pairs of

driving rollers remain in engagement on both sides of the strand.

4. An arrangement for guiding a cast strand extracted from a mould and horizontally deflected toward a horizontal guiding path while still having a liquid core, comprising

driving roller stands located along said horizontal guiding path and having two pairs of opposing driving rollers each, said driving roller stands being adjustable to the surface of the strand under pressure;



supporting roller stands in alternating arrangement with said driving roller stands along said horizontal guiding path and having at least five pairs of opposing upper and lower supporting rollers each, which rollers support the upper and lower sides of the strand, respectively; and

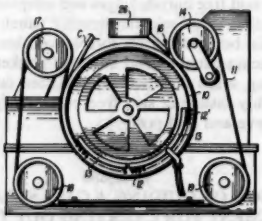
adjustable form-locking connection means for establishing the distance between said upper and lower supporting rollers said connection means being releasable for freeing from load the upper supporting rollers.

4,122,889

COOLING OF CONTINUOUSLY CAST BAR BY HYDRAULIC BAND LIFTING

Roy Richards, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Apr. 1, 1977, Ser. No. 783,580
Int. Cl.² B22D *11/06*
U.S. Cl. 164—87 **12 Claims**



1. In a wheel-band type continuous casting machine for casting molten metal into continuous cast bar, comprising a rotatable casting wheel having a groove formed in the periphery thereof which is closed over a portion of its length by an endless flexible metal band to form an arcuate mold having an inlet and an outlet, means for pouring molten metal into the inlet of the mold, means for cooling the molten metal in the mold to solidify the same in successive stages into cast bar, means for extracting the cast bar from the outlet of the mold, and wherein along a portion of the length of said arcuate mold the at least partially solidified cast bar shrinks away from the walls of the mold thus forming a gap therebetween;

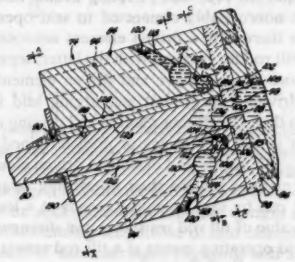
the improvement comprising means disposed in the region of said portion of the length of said arcuate mold for urging the at least partially solidified cast bar radially inwardly into contact with the walls of the casting groove so as to substantially close the gap therein and promote conduction heat transfer therebetween, wherein said urging means includes means for removing the band from a portion of the periphery of the casting wheel along a given segment of the arcuate length thereof disposed between the inlet and outlet of said mold, while maintaining said band in sealing contact with the periphery of the casting wheel over a substantial segment of the arcuate mold extending from each of the inlet and outlet, respectively, toward said given segment, and means for spraying a fluid jet into said arcuate mold in the region of said given segment between the cast bar and said band, said fluid jet exerting a pressure against the cast bar to force the same into contact with the walls of the casting groove.

4,122,890

NOZZLE FOR THE CONTINUOUS CASTING OF LEAD

Larry P. Atkins, Daleville, and James R. Bish, Anderson, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1977, Ser. No. 819,896
Int. Cl.² B22D *11/124, 11/10*
U.S. Cl. 164—444 **3 Claims**



1. A nozzle for continuously casting lead strip from a lead melt, said nozzle being adapted for cooling with a coolant readily vaporizable at the melting temperature of the lead and comprising: a metal body defining an open-ended mold cavity having a melt inlet and a strip outlet; a first cooling channel formed in said body at and circumscribing said inlet, said channel having a hot surface closest to the melt in the inlet and a colder surface opposite said hot surface; a second cooling channel in said body generally paralleling said first channel near the cold surface thereof for supplying said coolant under pressure to said first channel; means for supplying said second cooling channel with coolant, under pressure; and a plurality of ports intermittantly interconnecting said channels along substantially the full lengths thereof and through said cold surface, and being adapted to direct high velocity streams of said coolant against said hot surface to purge said hot surface of any vapor films formed thereon.

4,122,891

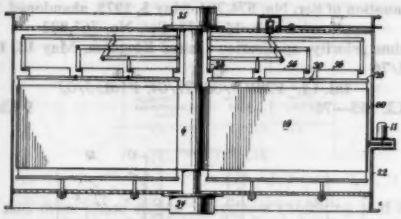
SECTOR PLATE SUPPORT

Roderick J. Baker, Belmont, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,533
Int. Cl.² F28D *19/00*
U.S. Cl. 165—9 **5 Claims**

1. Rotary regenerative heat exchange apparatus having a rotor including a central rotor post and a concentric rotor shell spaced therefrom to provide an annular space therebetween, a mass of heat absorbent material carried in the space between the rotor post and the rotor shell, a housing surrounding the rotor in spaced relation including inlet and outlet ducts at opposite ends thereof for a heating fluid and for a fluid to be heated, a support bearing at one end of the rotor adapted to support the rotor for rotation about its axis, a guide bearing at the opposite end of the rotor adapted to preclude radial movement of the rotor post, means for rotating the rotor about its

axis, an articulated sector plate having radially adjacent plane sections pivotally joined to separate the heating fluid from the fluid to be heated, axially disposed support means adjacent the rotor post movable in response to axial expansion of the rotor post, an actuator for each section of the sector plate comprising

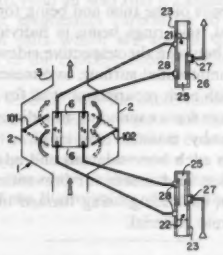


a lever extending radially outward from the axial support means, a pivotal linkage connecting each lever to the support means and to an independent section of the sector plate, and a fulcrum for each lever actuator mounted on said housing to provide an axial movement to each section of the sector plate in response to axial movement of the rotor post.

4,122,892
DEVICES FOR HEATING PREMISES BY THE USE OF HEAT PUMPS AND METHOD THEREFOR

Jean-Charlemagne Delaporte, Saint Bruno de Montarville, Canada, assignor to S.A. dite Compagnie Generale de Chauffe, Saint Andre, France

Filed Oct. 7, 1976, Ser. No. 730,454
Claims priority, application France, Oct. 16, 1975, 75 32232
Int. Cl.² F25D *21/12*
U.S. Cl. 165—12 **10 Claims**



1. An improved device for and in combination with heating premises utilizing a heat pump, comprising

premises to be heated,

at least two evaporators mounted adjacent the premises and having refrigeration fluid circulating therethrough when activated, respectively,

means for continuously directing air withdrawn from the premises at a temperature higher than 0° C onto both of said evaporators in sequence one after the other for cooling the air, said two evaporators being arranged in series with respect to the flow of the air and recovering heat energy from the air withdrawn from the premises, said means including means for reversing the sequence of the flow of the air onto said evaporators,

a separate heating fluid means for heating the premises,

condenser means operatively connected to said evaporators in communication with the refrigeration fluid for reheating the separate heating fluid means used for heating the premises by the recovered heat from the air being transferred to the heating fluid means via the refrigeration fluid,

means for operating each of said evaporators in cycles one at a time while the other of said evaporators is inactivated, and with reversal of the sequence of the flow of the air onto said evaporators for simultaneously effecting a reversal in the operative and inactivated conditions of said evaporators, respectively, such that said first-mentioned operative evaporator simultaneously with the reversal of the sequence of flow of the air is momentarily and completely inactivated totally stopping circulation of refrigeration fluid therethrough and activating said other evaporator, initially with the air withdrawn from the premises being directed first onto one of said evaporators and in sequence then onto another of said evaporators, while said one evaporator is inactivated with no refrigeration fluid therethrough and said another evaporator is activated with circulation of the refrigeration fluid therethrough, with the air defrosting said one evaporator and being cooled and expelled at a temperature lower than normal such that said another evaporator becomes frosted, such that the reversing of the activated and inactivated conditions of said evaporators, respectively, as well as the reversing of the sequence of the flow of air to be cooled and expelled being effected as soon as the activated said another evaporator becomes covered with frost and said one evaporator is defrosted, thereupon reversing the sequence of the air flow, inactivating said another evaporator totally stopping the circulation of refrigeration fluid therethrough and activating said one evaporator, and so on cyclically, all reversals and operational conditions being effected continuously without interruption without other change in the operation of the refrigeration, in the heating fluids and in intake of the air, and also without any effect on the temperature of the heating fluid means, the defrosting of the inactivated evaporator being effected by the heat alone contained in the air withdrawn from the premises, ensuring per se only the heating of the premises due to removal of considerable quantities of heat from the air, by considerably lowering its temperature,

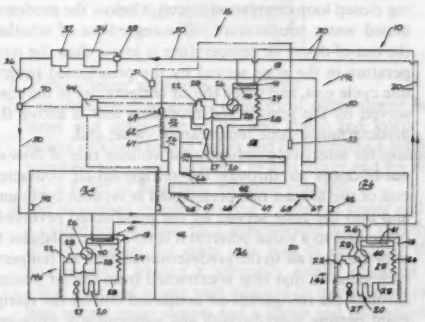
said means for reversing the sequence of the flow of air completely over each of the evaporators constitute swinging flap valves adjacent each of said evaporators,

said reversing means for simultaneously swinging said flap valves in opposed directions up to opposite respective ends of the evaporators, so as to allow the air to completely pass over the evaporators in respective sequence.

4,122,893
AIR CONDITIONING SYSTEM

Roger L. Thompson, Sherrard, Ill., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Mar. 7, 1977, Ser. No. 774,585
Int. Cl.² F25B *29/00*
U.S. Cl. 165—16 **10 Claims**



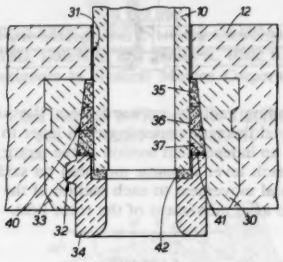
1. A heating and cooling system for controlling the air temperature within a plurality of zones in a multi-zoned building, the system comprising:

(a) at least one reversible cycle air cooling and heating unit for heating and cooling the air in each zone, each reversible cycle unit comprising:
at least one refrigerant-water contacted coil;
at least one refrigerant-air contacted coil;
a refrigerant compressor;
refrigerant expansion means;
refrigerant flow control means operable to selectively cause the refrigerant-air contacted coil to function as a refrigerant condensor and the refrigerant-water contacted coil to function as a refrigerant evaporator, or cause the refrigerant-air contacted coil to function as a refrigerant evaporator and the refrigerant-water contacted coil to function as a refrigerant condensor;
a refrigerant carrying conduit providing a closed path for refrigerant between the refrigerant-water contacted coil, the refrigerant-air contacted coil, the compressor, refrigerant expansion means, and refrigerant control means; and,
(b) a water carrying closed loop circulation circuit connected with the refrigerant-water contacted coil of each reversible cycle air heating and cooling unit of the system so that the water flowing from the closed loop circuit through the refrigerant-water contacted coils functioning as refrigerant condensors extracts heat from the refrigerant flowing through the refrigerant-water contacted coil and the extracted heat accumulates in the water flowing in the closed loop circuit, and so that the water flowing from the closed loop circuit through the refrigerant-water contacted coils functioning as refrigerant evaporators yields heat to the refrigerant flowing through the refrigerant-water contacted coils;
(c) energy economizer means comprising:
means for selectively preventing activation of the the refrigerant compressor of at least one preselected reversible cycle units when the temperature of the water in the water carrying closed loop circulation circuit is above a predetermined water temperature value, when the out-of-doors air temperature is lower than the air temperature in the zone served by the preselected reversible cycle unit, and when the zone air temperature is above a predetermined zone air temperature value;
means for selectively passing an appropriate volume rate of flow of out-of-doors air through the refrigerant-air contacted coil of the at least one preselected reversible cycle unit and into the zone served by the preselected reversible cycle unit to cool the zone air to the predetermined zone air temperature value; and,
(d) economizer override means comprising:
means for selectively activating the refrigerant compressor of the at least one preselected reversible cycle unit when the temperature of the water in the water carrying closed loop circulation circuit is below the predetermined water temperature value regardless of whether the out-of-doors air temperature is lower than the temperature in the zone served by the preselected reversible cycle unit, and when the air temperature in the zone served by the preselected reversible unit is above the predetermined zone temperature value; and,
means for selectively reducing the volume rate of flow of out-of-doors air through the refrigerant-air contacted coil of the at least one preselected reversible cycle unit and into the zone served by the preselected reversible cycle unit to a value whereat it is no longer adequate to cool the zone air to the predetermined zone air temperature value so that heat is extracted from the air passing through the refrigerant-air contacted coil by the refrigerant passing therethrough and subsequently extracted from the refrigerant by the water passing through the refrigerant-water contacted coil to heat the water flowing in the closed loop circulation circuit back to at least the predetermined water temperature value.

4,122,894
TUBE MOUNTING MEANS FOR A CERAMIC RECUPERATOR

William R. Laws, Worcester Park, and David A. Winkworth, Aldershot, both of England, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 574,704, May 5, 1975, abandoned. This application Feb. 11, 1977, Ser. No. 767,802
Claims priority, application United Kingdom, May 13, 1974, 20998/74
Int. Cl.[2] F28F *9/08, 21/04;* F16L *5/02*
U.S. Cl. 165—76 9 Claims



1. A recuperator including refractory walls, at least one horizontal ceramic tube located at each of its ends in tapered bores in opposite vertical refractory walls of the recuperator, such bores having sidewalls which have their minimum diameters located away from the ends of the tube, a plurality of annular seals extending between the outer circumferential surface of the end portion of each tube and the corresponding bore, each seal being comprised of a plurality of separate rings having outside diameters that are progressively larger in diameter towards the ends of the tube and being formed of fibrous refractory material, said rings being in individually precompressed condition between the respective sidewall of the bore and the tube circumferential surface, and means held in place by engagement with each recuperator wall for preventing the precompressed rings from expanding in a direction parallel to each tube to thereby maintain the rings in precompressed condition between each bore sidewall and adjacent tube circumferential surface, said means for preventing the precompressed rings from expanding being formed in a single piece wholly from ceramic material.

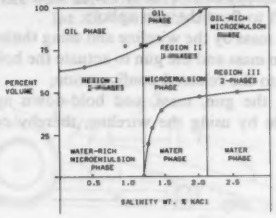
4,122,895
CORRELATION OF WEIGHTED EFFECT OF DIFFERENT IONS AND SURFACTANT COMPOSITION FOR SURFACTANT FLOOD

Donald M. Sitton, and Ronald E. Terry, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 6, 1977, Ser. No. 804,122
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—252 28 Claims

1. A method for forming a surfactant system comprising a surfactant, a cosurfactant and brine, said method comprising
(a) analyzing water available for said system for Na^+, Ca^{++}, and Mg^{++};
(b) forming said brine with a Na^+ weight equivalent concentration equal to the actual weight percent Na^+ concentration plus about 14 times the Ca^{++} concentration plus about 16 times the Mg^{++} concentration, which puts the system in the three-phase region of a phase volume dia-

gram of said system equilibrated with oil corresponding to that to be produced, or at least immediately adjacent to said three-phase region in systems exhibiting said three-phase behavior over a narrow range of salinity.



4,122,896

ACIDIZING CARBONATE RESERVOIRS WITH CHLOROCARBOXYLIC ACID SALT SOLUTIONS

Ronald F. Scheuerman; Edwin A. Richardson, and Charles C. Templeton, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 14, 1977, Ser. No. 842,204
Int. Cl.² E21B *43/27*
U.S. Cl. 166—250 **14 Claims**

1. A process for relatively slowly acidizing a carbonate material in or around a well that communicates with a subterranean earth formation, which process comprises:

compounding an aqueous solution that contains at least one chlorocarboxylic acid salt and is substantially free of acid;

arranging the composition of the solution so that, at the temperature of the subterranean earth formation, the chlorocarboxylic acid salt hydrolyzes at a selected relatively slow rate to yield an acid that is capable of reacting with calcium or magnesium carbonates to form calcium or magnesium salts which are soluble at a concentration equivalent to the concentration of chlorocarboxylic acid salt; and

injecting the solution into the subterranean earth formation at a rate such that the carbonate material to be acidized is contacted by the solution before it contains enough acid to dissolve a significant proportion of the carbonate material, so that the rate of the acidization is limited to substantially the rate of the hydrolyzing of the chlorocarboxylic acid salt.

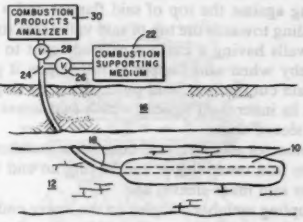
4,122,897

IN SITU GASIFICATION PROCESS FOR PRODUCING PRODUCT GAS ENRICHED IN CARBON MONOXIDE AND HYDROGEN

John P. Capp, and Larry A. Bissett, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 28, 1977, Ser. No. 865,156
Int. Cl.² E21B *43/24*
U.S. Cl. 166—256 **7 Claims**

1. A method for increasing the concentration of carbon monoxide and hydrogen in the gaseous product resulting from the in situ combustion of coal in a subterranean coal bed, comprising the steps of providing a borehole in the coal bed, initiating an exothermic reaction in the coalbed contiguous to said borehole to establish a combustion zone in the coal bed, introducing combustion supporting medium into said combustion zone to support the reaction without exhausting the resulting gaseous products from the combustion zone and the coal bed, increasing the pressure of the combustion supporting medium flowing into the combustion zone for maintaining the reaction while forcing the gaseous products together with natural water in the coal bed into the coal bed away from the combustion zone, maintaining the flow of the combustion supporting medium into said combustion zone until the predetermined temperature and pressure are attained, terminating the flow of the combustion supporting medium into the combustion zone, and initiating outflow of the gaseous products from the combustion zone for decreasing the pressure therein causing water and gaseous products forced away from the



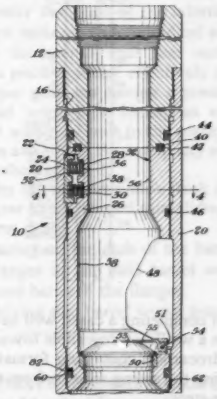
combustion zone to bleed through the coal bed into the combustion zone where the water and carbon dioxide in the gaseous products react endothermically with hot carbon defining the walls of the combustion zone to respectively effect the conversion of the water to carbon monoxide and hydrogen and the carbon dioxide to carbon monoxide.

4,122,898

TUBING TESTER

Wayne F. Nelson, Wichita Falls, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 25, 1977, Ser. No. 772,198
Int. Cl.² E21B *43/12*
U.S. Cl. 166—325 **6 Claims**



1. Tubing tester apparatus comprising:

(a) an elongated generally cylindrical outer sleeve having inner and outer side walls, and upper and lower ends, means adjacent to said upper end for coupling a connector member, lug means adjacent to said lower end for receiving a J-slot of an axially movable mandrel;

(b) an elongated mandrel having a rounded upper end part, a cylindrical middle part dimensioned to fit closely but slidably against the inner side wall of said outer sleeve, said mandrel having a generally axially disposed elongated grooved lower part adapted to move between said lugs in said outer sleeve, and a lower end part adapted to receive a coupling member;

(c) an inner sleeve having inner and outer side walls, an upper end part and a lower end part, said lower end containing a flapper valve assembly disposed across said

lower end part, said valve assembly including a valve seat structure having an axial aperture larger than the rounded upper end part of said mandrel and in axial alignment therewith and a spring loaded flapper having a double ended pivot part at one side, said pivot part being disposed in a transversely disposed grooved part of said lower end part, said spring loading including a spring coiled around said pivot of said flapper, said spring having one end bearing against the top of said flapper and a second end extending towards the top of said valve seat structure, said side walls having a cut out part adjacent to said flapper whereby when said flapper is fully open it partially fits into said cut out part, said outer sleeve having a shoulder along its inner wall against which said lower end of said inner sleeve abuts;

(d) a connector member, said connector member being coupled to said outer sleeve and having an end which abuts against said inner sleeve, and

(e) a coupling member coupled to the lower end part of said mandrel and abutting against said grooved part.

4,122,899

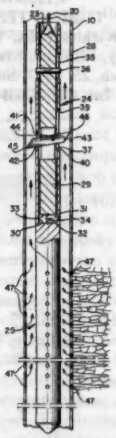
WELL PERFORATOR WITH ANCHOR AND METHOD

Emmet F. Brieger, General Delivery, Nogal, N. Mex. 88341

Filed Aug. 8, 1977, Ser. No. 822,556

Int. Cl.² E21B *43/119, 40/00*

U.S. Cl. 166—297 **9 Claims**



8. Method of completing a cased well having a tubing string extending from a wellhead downhole towards and terminating short of a hydrocarbon containing formation, with a packer device separating the casing annulus from the lower borehole, comprising the steps:

running a perforating gun and tool hold-down apparatus downhole on a wireline and positioning the gun adjacent the hydrocarbon containing formation;

detonating the perforating gun to perforate the casing thereby communicating the interior of the casing with the hydrocarbon containing formation;

immediately open flowing the well concurrently with perforating the casing to surge the perforations with the maximum available driving force, thereby flowing the gun uphole due to the pressure drop thereacross;

suspending a mass from the wireline and suspending the perforating gun from the mass by a lost motion coupling so that as the gun commences to move uphole the mass remains stationary;

using the relative motion between the gun and the mass to set a tool hold-down apparatus, thereby arresting uphole travel of the gun;

flowing the well for an interval of time in order to clean up the formation;

reducing the flow rate, thereby reducing the pressure differential across gun to a value which does not provide sufficient lift to flow the gun uphole;

lifting the mass by the wireline and using the relative motion between mass and the gun to actuate the hold-down apparatus into the released configuration;

removing the gun, mass, and hold-down apparatus from borehole by using the wireline, thereby completing the well.

4,122,900

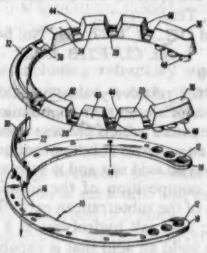
MULTIPURPOSE CUSHIONED HORSESHOE

Donald H. Barr, 8114 Gorman Ave., Laurel, Md. 20810, and Thomas A. Coggins, Box 121, Savage, Md. 20863

Filed Nov. 19, 1976, Ser. No. 743,479

Int. Cl.² A01L *7/06*

U.S. Cl. 168—12 **8 Claims**



1. A cushioned horseshoe for a racehorse comprising:

a generally "U" shaped metal horseshoe plate;

having a generally rectangular cross section of substantially uniform thickness;

having a hoof engaging surface and a tread bearing surface;

having a plurality of conventional nail holes extending through said plate and spaced longitudinally therealong, the last nail hole on each arm of said "U" shaped plate being spaced from the free ends thereof;

a heel portion extending from the last of said nail holes on each arm of said "U" shaped plate longitudinally therealong to the free ends thereof;

having one or more heel cushion holes through each heel portion of said plate from said hoof engaging surface to said tread bearing surface;

a unitary resilient tread bonded to substantially the entire tread bearing surface of said plate and molded to include:

a base portion of uniform thickness bonded directly to the tread bearing surface of said plate and extending substantially thereacross;

a toe calk raised above said base portion;

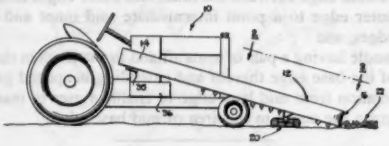
a heel calk raised above said base portion on each heel portion thereof, said base including in each said heel portion projections extending through said heel cushion holes in said plate and adapted to resiliently engage the horse's hoof to provide a substantial thickness of resilient cushioning material for the horse's heel equal to the combined thickness of said projection, said base and said heel calk; and,

a plurality of traction cleats raised above said base and distributed from said toe calk to said heel calks and positioned between said nail holes.

4,122,901
UNPOWERED SUPPORT VEHICLE

Gilbert L. Koepplin, 25173 N. Hwy. 99, Acampo, Calif. 95220

Filed Jun. 25, 1975, Ser. No. 590,140
Int. Cl.[2] A01D *25/00*
U.S. Cl. 171—61 13 Claims



4. In combination: a vehicle having a radish picker apparatus cantilevered outward therefrom and downward toward the ground;

a second vehicle which is non-powered and has a frame with sprockets at each corner thereof, two sprocket-chains positioned over said sprockets on each side of said second vehicle and flexible segmented belt track means attached to said chains;

said second vehicle being positioned adjacent the unsupported end of said cantilevered radish picker apparatus and being attached to support said unsupported end;

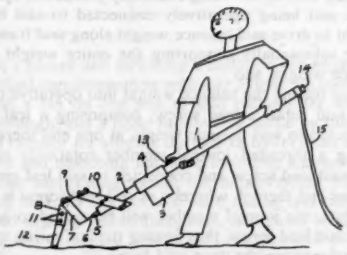
means for adjusting the up-down and fore-aft position of said second vehicle to position said unsupported end of said radish picker close to the ground in radish picking height;

whereby said belt track means allows said second vehicle to be moved over the surface of the ground by motive power from said cantilevered means and to cause said radish picker apparatus to follow the ground contour.

4,122,902
MOTORIZED GARDENING TOOL

Warren A. Alexander, P.O. Box 147, Industry, Tex. 78944

Filed Oct. 11, 1977, Ser. No. 840,552
Int. Cl.[2] A01B *1/06*
U.S. Cl. 172—41 4 Claims



1. A garden cultivating tool comprising:

(a) a first shaft having a central bore,

(b) a second shaft within said bore,

(c) power means for imparting a first reciprocating motion to said second shaft,

(d) an assembly of parts for converting said first motion to a second reciprocating motion, and

(e) a blade in combination with said assembly,

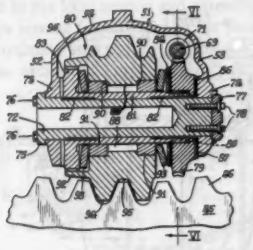
(f) said assembly including a first spring member connecting said second shaft to a linkage member which supports said blade, and

(g) a second spring member supporting said linkage member at a point substantially separated from the point at which said first spring member is connected.

4,122,903
MOTOR GRADER CIRCLE DRIVE

Carroll R. Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 14, 1976, Ser. No. 696,020
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—781 20 Claims



20. In a motor vehicle which includes a mobile frame, a first member on said mobile frame and a second member on said mobile frame which is rotatable relative to said first member about a vertical axis, improved means for driving said second member comprising, in combination:

an internal gear of predetermined pitch diameter on one of said members;

a support detachably mounted on the other of said members inside the circle defined by the internal spur gear;

gear mounting means journalled in said support;

a barrel worm gear non-rotatably mounted for axial sliding movement on the gear mounting means, said worm gear having ends with a convex longitudinal surface therebetween which has a radius of curvature substantially equal to and no greater than that of the internal spur gear, a helical tooth on said convex longitudinal surface which is engaged with the internal spur gear teeth, said helical tooth having a pitch diameter effectively equal to that of the internal spur gear and having a predetermined lead angle, and said worm gear having an axis of rotation which is tilted with reference to the plane of the internal spur gear on an axis which is substantially equal to the lead angle of the helical tooth;

flanges carried by the support which flank the ends of the barrel worm gear to restrict said axial sliding movement of the barrel worm gear;

spring means bearing on the ends of the barrel worm gear and on the flanges to bias said barrel worm gear to a position centered between the flanges;

and means for driving said barrel worm gear.

4,122,904
PNEUMATIC HAMMER DRIVER

Harry M. Haytayan, Lincoln, Mass., assignor to Pneutek, Inc., Billerica, Mass.

Filed Jan. 27, 1977, Ser. No. 763,061
Int. Cl.[2] B25C *1/04, 5/02*
U.S. Cl. 173—15 12 Claims

1. A pneumatic driver for driving fasteners into a work surface comprising:

a cylinder including an end wall closing off one end of said cylinder, said end wall including (a) an interior surface normal to the axis of said cylinder, (b) a hole, and (c) a coaxial cavity intersecting said interior surface and open to the interior of said cylinder, said cavity being defined by inner and outer walls spaced respectively from said hole and said cylinder and the cross-section of the cavity widening with increasing depth from said interior surface;

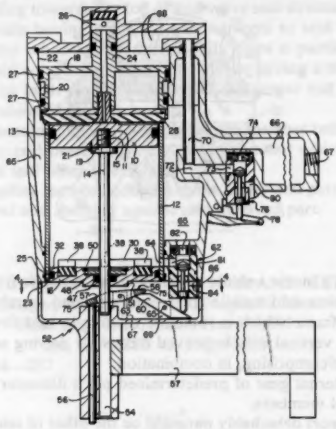
a piston slidably disposed in said cylinder;

a resilient piston cushion molded into said cavity and spaced from the cylindrical wall of said cylinder, said cushion

extending to a predetermined height above said interior surface;

a port extending through said cylindrical wall adjacent said end wall and being positioned clear of said cushion;

a foot portion positioned beyond said end wall, said foot portion including a bore coaxial with said hole and said cylinder and adapted to receive successive ones of said fasteners; and



a hammer in the form of a shaft coaxially connected to said piston, said hammer extending through said hole with said cushion coaxially spaced from said hammer, said hammer further extending into said bore and being adapted to drive said fasteners successively into said work surface, the length of said hammer being chosen to position said piston immediately adjacent said cushion when the free end of said hammer makes contact with said work surface.

4,122,905

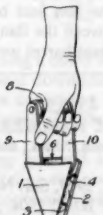
HAND AUGER

Frederick R. Kanigan, Nelson, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 15, 1977, Ser. No. 787,771

Int. Cl.[2] E21C *19/00*; A01B *1/00*

U.S. Cl. 175—396 **3 Claims**



1. A hand auger, comprising

a substantially frustoconical sheet of material having a substantially circular base edge and a bottom edge spaced from the base edge, said sheet of material being split along a substantially lateral strip to form a pair of substantially lateral edges in spaced relation radially and in spaced relation circumferentially from the bottom edge to an area intermediate the base and bottom edges, one of the edges being an inner edge of predetermined length and the other of the edges being an outer edge having a length longer than the predetermined length and extending beyond the inner edge at the bottom edge of the sheet to substantially a point, the bottom edge of the sheet being of substantially spiral configuration from the bottom of the inner edge to the bottom of the outer edge and the base edge being of split circular configuration and having a plurality of equidistantly spaced substantially circular cutouts formed therein forming a plurality of cutting teeth along said bottom edge between the inner and outer edges from said outer edge to a point intermediate said inner and outer edges; and

a handle having a pair of arms affixed to the sheet in the area of the base edge thereof and extending in spaced parallel relation from said base edge to enable a user to manually grasp the auger in the area of said base edge.

4,122,906

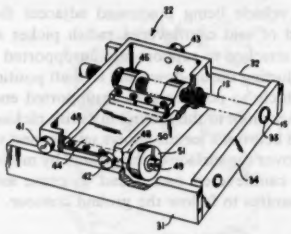
LOAD COUPLING DEVICE

Anthony Storace, Tarrytown, N.Y., and Paul R. Sette, Hamden, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jun. 17, 1977, Ser. No. 807,394

Int. Cl.[2] G01G *1/38*

U.S. Cl. 177—213 **4 Claims**



1. In an analytical balance having a movable balance weight displaceable along a pivoting balance beam, the balance weight and balance beam combination comprising:

a frame mounted for pivotable movement in response to the advancement of the balance weight upon the frame;

the balance weight being mounted for rolling movement upon said frame;

a rotatably lead screw being rotatively journalled upon said frame and being operatively connected to said balance weight to drive said balance weight along said frame, said frame substantially supporting the entire weight of the balance weight; and

means for biasing the balance weight into operative contact with said rotative lead screw, comprising a leaf spring connected to said balance weight at one end thereof and having a threaded journal member rotatively engaged with said lead screw and connected to said leaf spring on another end thereof, whereby as said lead screw is caused to rotate, the journal member will be caused to advance upon said lead screw, thus forcing the leaf spring to move said balance weight upon said frame.

4,122,907

ELECTRICALLY ASSISTED CYCLES

Charles P. D. Davidson, Droitwich, and Edward G. Philips, Colne, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jun. 9, 1977, Ser. No. 805,131

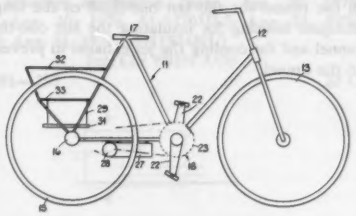
Claims priority, application United Kingdom, Jun. 11, 1976, 24244/76

Int. Cl.[2] B62M *7/00*

U.S. Cl. 180—33 C **4 Claims**

1. An electrically assisted cycle including a frame rotatably supporting a ground engaging wheel, rider operable drive means mounted on the frame and mechanically coupled to said wheel whereby the rider can physically operate said drive

means to propel the cycle, and electric motor and an associated power source carried by said frame, the output of said electric motor being coupled to said wheel whereby said motor can assist propulsion of the cycle, electrical switch means operable to energize said motor and sensing means for sensing the speed



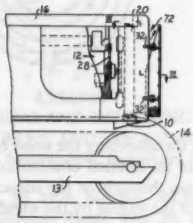
of rotation of said rider operable drivemeans and for causing operation of said switch means to energize said motor only when said drive means is operated by a rider in excess of a predetermined speed whereby in order to obtain electrical assistance in propelling the cycle the rider must rotate said drive means at a speed in excess of said predetermined speed.

4,122,908

FAN NOISE SUPPRESSOR AND BAFFLE

Bruce W. Miers; Frederick D. Proksch, both of Peoria, and Gerald H. Welker, Eureka, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sep. 12, 1977, Ser. No. 832,253
Int. Cl.² B60K *11/04*
U.S. Cl. 180—68 P **5 Claims**



1. In a power unit including a liquid-cooled engine, a radiator in fluid communication with said engine for cooling engine coolant, a fan on one side of said radiator for directing air therethrough, and a noise suppressing baffle on the other side of said radiator for altering the path of travel of air exiting said radiator and absorbing fan noise including a housing containing noise suppressing means, the improvement wherein said housing includes a perforated panel facing said radiator other side and slightly spaced therefrom, said panel being pyramid-shaped and extending toward said radiator and presenting at least three generally planar surfaces intersecting at a common point to said radiator.

4,122,909

AIR CUSHION SKIRT

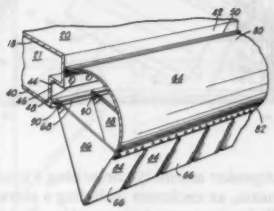
Delbert W. Fair, and Graydon L. Brown, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Mar. 3, 1977, Ser. No. 773,925
Int. Cl.² B60V *1/16*
U.S. Cl. 180—127 **6 Claims**

1. An air retention skirt apparatus for use with air cushion vehicles of the type having at least one peripheral side structure and bottom beneath which an air cushion is formed, comprising:

plural loop sections affixed serially around the peripheral side structure in arcuate attitude to surround and retain said air cushion, said plural loop sections including a plurality of loop sections for affixture to the straight peripheral side structure and a plurality of corner loop sections for affixture to the curved peripheral side structure; and

plural segment sections affixed continuously in series along each of said loop sections, each segment section being secured to the loop section and extending a pair of securing flaps inward for affixture to the peripheral side structure proximate said bottom in attitude to retain said air cushion, said plural segment sections including a first



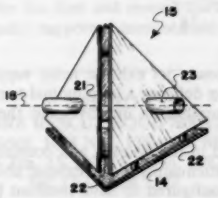
plurality of segment sections having a generally rectangular central panel extending into securing flaps which are foldable at 90° to extend in parallel and with each terminating in a fastener tab pivotably affixed to said peripheral side structure proximate said bottom, and said plural segment sections further including a second plurality of corner segment sections having a central panel having parallel upper and lower edges and defining oppositely angled side securing flaps which are each foldable more than 90° to extend in convergence and with each terminating in a fastener tab pivotably affixed to said peripheral side structure proximate said bottom.

4,122,910

OMNIPHONIC MICROPHONE AND LOUDSPEAKER SYSTEM

Raymond Wehner, 241 Eveline St., Selkirk, Canada

Filed Mar. 4, 1977, Ser. No. 774,451
Claims priority, application United Kingdom, Mar. 16, 1976, 10502/76
Int. Cl.² H05K *5/00*
U.S. Cl. 181—144 **12 Claims**

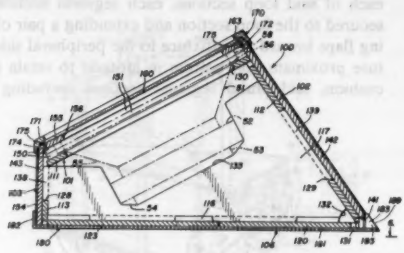


1. A transducer system for use in a sound system comprising in combination a tetrahedron support module, said module including four panels assembled to form said tetrahedron, a pair of transducers mounted one in each of two of said panels which are adjacent one another, said transducers being mounted on a horizontal line of sight and rotated 180° one with the other.

4,122,911
LOUDSPEAKER ASSEMBLY

Robert E. Croup, Indianapolis, Ind., assignor to Acoustic Fiber Sound Systems, Inc., Indianapolis, Ind.

Filed Jul. 1, 1976, Ser. No. 701,974
Int. Cl.[2] A47B 81/06; H05K 5/00
U.S. Cl. 181—199 15 Claims

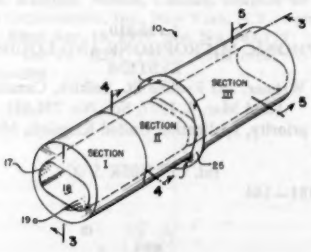


1. A loudspeaker assembly comprising a loudspeaker having a magnet means, an enclosure including a plurality of interconnected walls for accommodating said loudspeaker therein, one of said walls having an opening therein to facilitate the emission of sound waves from said enclosure, and support means carried within said enclosure and having rear and side supporting surfaces respectively disposed for supporting engagement with said magnet means along the rear and sides thereof to support said loudspeaker in said enclosure.

4,122,912
DRY COOLED JET AIRCRAFT RUNUP NOISE SUPPRESSION SYSTEM

Meyer Lepor, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 23, 1977, Ser. No. 780,571
Int. Cl.[2] F01N 1/02, 7/02
U.S. Cl. 181—218 7 Claims



1. In a stationary jet exhaust noise suppressor having an elongate housing defining a longitudinal tunnel for passing jet exhaust therethrough, an improvement therefor is provided comprising:

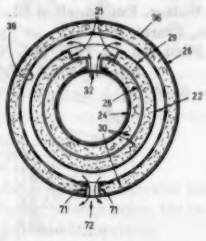
means carried in the housing and communicating with the tunnel for attenuating the jet exhaust noise, the attenuating means is configured to have resonant frequencies which are the same as objectionable frequencies in the jet exhaust noise spectrum, the attenuating means is located outside the lateral dimensions of the longitudinal tunnel and extends the length of the longitudinal tunnel, is formed of more than one section differently configured from one another to have different resonant frequencies corresponding to different objectionable frequencies in the jet exhaust noise spectrum and is formed of a number of rigid panels shaped to define a number of empty resonant chambers, some of the rigid panels are provided with a number of perforations to communicate the resonant chambers with jet exhaust in the tunnel and

means formed in the shape of an annular duct and provided two-thirds along the length of the elongate housing for drawing an annular flow of ambient air into the jet exhaust in the tunnel for the last one-third of the length of the elongate housing for insulating the last one-third of the tunnel and for cooling the jet exhaust to prevent damage to the tunnel.

4,122,913
SILENCER

Leslie W. Stemp, 3089 Jaguar Valley Dr., Mississauga, Ontario, Canada (L5A 2J1)

Filed Aug. 9, 1976, Ser. No. 712,482
Int. Cl.[2] F01N 1/04, 1/08, 1/12
U.S. Cl. 181—256 2 Claims



1. A silencer for absorbing the noise energy carried with the exhaust gases of an internal combustion engine, while freely moving the gases throughout the silencer without increase of back-pressure to the engine by the silencer comprising in combination;

a substantially cylindrical body composed of an inner shell and an outer shell concentrically fixed apart from one another to define an open space therebetween and having opposite ends thereto defining bulkheads to said body;

exhaust gas inlet means in each of said bulkheads to direct gas into the interior of said inner shell;

said outer shell having an outer imperforate wall and an inner perforate wall defining a space therebetween;

said inner shell having an imperforate wall with an inner and outer perforate wall spaced apart from said imperforate wall of said inner shell to define a space on either side thereof;

a slot-shaped duct extending through the inner shell between said bulkheads and having an opening area at least the total area of the combined gas inlet opening means;

a slot-shaped duct extending through the outer shell between the bulkheads diametrically opposite the slot-shaped duct extending through the the inner shell and having an opening area at least equal to the total area of the combined inlet means; and

noise-energy absorbing material filling the spaces between the perforate and imperforate walls of the inner and outer shells;

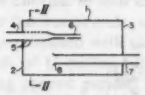
thereby creating a passage for exhaust gases in said silencer having noise-energy absorbing walls for the whole interior of said silencer.

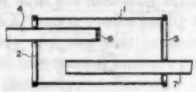
4,122,914

MUFFLER

Eizo Suyama, Mitaka, Japan, assignor to Nihon Radiator Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1977, Ser. No. 789,917
Claims priority, application Japan, Apr. 30, 1976, 51-53200[U]; Apr. 30, 1976, 51-53201[U]; Aug. 31, 1976, 51-115747[U]; Aug. 31, 1976, 51-115748[U]
Int. Cl.[2] F01N 3/06
U.S. Cl. 181—258 23 Claims





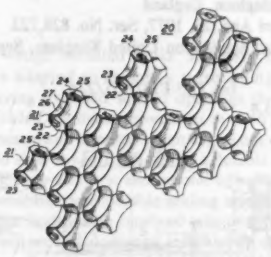
1. Muffler of the expansion type comprising a sealed, essentially cylindrical main body, front and back end plates at each end of said main body, an exhaust gas inlet pipe entering said main body through said front end plate and having a downstream end, an exhaust gas outlet pipe leading out of said main body through said back end plate and having an upstream end within said main body, said upstream end being outwardly flared for reduction of contraction loss and of noise as exhaust gas enters said outlet pipe, and in particular for eliminating Karman's vortex street and the attendant noise thereof.

4,122,915

SOUND ABSORBING AND DIFFUSING UNIT, AN ACOUSTIC SCREEN AND/OR A PARTITION

Kazunori Taguchi, 6-8, Sakanoshita, Kamakura City, Kanagawa Prefecture, Japan

Filed Jun. 30, 1976, Ser. No. 701,016
Claims priority, application Japan, Jun. 30, 1975, 50-81296; Jul. 12, 1975, 50-96921[U]
Int. Cl.[2] E04B 1/99
U.S. Cl. 181—284 2 Claims



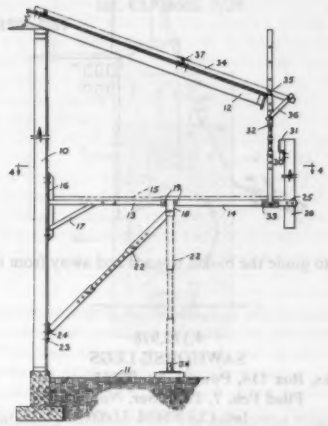
1. A sound absorbing and diffusing unit made of porous sound absorbing material, formed as a square having an arc-shaped cut out at each corner with a flat apex portion at each side, each arc-shaped portion tapered to form a ridge, wherein each apex of said unit is flattened, each arc-shaped side of said unit is formed into a ridge, a projection is radially provided on two neighboring apexes each respectively and a cavity is radially formed into two other neighboring apexes each respectively.

4,122,916

SCAFFOLDING

William C. Strobel, W. 4615 Wellesley, Spokane, Wash. 99205

Filed Jun. 6, 1977, Ser. No. 803,787
Int. Cl.[2] E04G 3/08
U.S. Cl. 182—82 8 Claims



1. A scaffold structure for placement on an upright wall element, comprising:

first and second horizontal members adapted to support a horizontal work platform rested on the upper surfaces thereof;

said first horizontal member having opposed inner and outer ends;

means fixed to the inner end of the first horizontal member for securing it to an upright wall element at an above-ground elevation;

said second horizontal member having opposed inner and outer ends, the inner end of the second horizontal member being telescopically supported on the outer end of said first horizontal member coaxial adjustment relative thereto;

means for fixing said second horizontal member to said first horizontal member;

a bracket fixed to the inner end of said second horizontal member;

said bracket being open downwardly as well as vertically along a direction facing the first horizontal member;

and upright support means affixed to said bracket and extending downward perpendicular to said horizontal members or downward at an angle inclined to a fixed reference, whereby the first and second horizontal members are elevationally supported intermediate their combined lengths.

4,122,917

FIRE RESCUE EQUIPMENT

Theodore T. Kendrick, 1615 NW. 130th St., Miami, Fla. 33167

Filed Jun. 23, 1977, Ser. No. 809,158
Int. Cl.[2] A62B 1/02
U.S. Cl. 182—144 7 Claims

1. Fire rescue equipment for mounting on the roof of a building comprising:

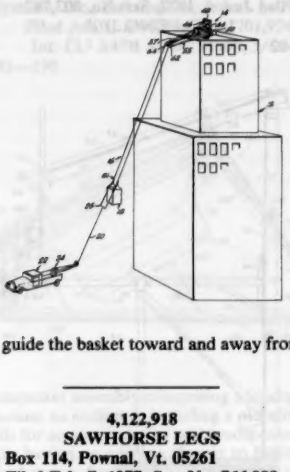
(a) a boom including means to rotatably mount the boom to the roof,

(b) said boom including pulley means and cable means including means to raise and lower the cable means toward ground level upon operation of the pulley means;

(c) a basket including means to connect to the cable; and

(d) a guide means comprising a tie line to be raised and

lowered by the cable to guide the basket, said tie line including means to connect to a towing device at ground



level to guide the basket toward and away from the building.

4,122,918

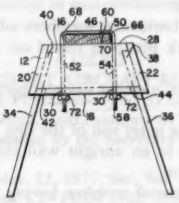
SAWHORSE LEGS

John Danks, Box 114, Pownal, Vt. 05261

Filed Feb. 7, 1977, Ser. No. 766,088

Int. Cl.² F16M *11/00*

U.S. Cl. 182—181 **1 Claim**



1. A pair of sawhorse legs for forming a bench, wherein each said sawhorse leg comprises:

(a) a frusto-pyramidal shaped bracket having a base, a pair of upwardly extending end walls, an upwardly extending front wall, an upwardly extending rear wall, and an open top, said base having a plurality of spaced holes therethrough:

(b) the upper ends of a pair of legs affixed to the inner surface of said end walls, each said leg extending downwardly through a pair of slots in said base and being adapted to engage the ground; and

(c) a clamp, said clamp having a center section and a pair of perpendicular end sections extending out in the same direction from said center section, a free end of each end section being externally threaded, said center section engaging on an upper surface of said board element, said free ends of said end sections extending through a pair of said holes in said base, and a nut threadably engaging onto each said free end below said base.

4,122,919

SPEED CONTROL APPARATUS FOR AC ELEVATOR

Nobuo Anzai, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1977, Ser. No. 778,218

Claims priority, application Japan, Mar. 23, 1976, 51-31579; Apr. 13, 1976, 51-41711

Int. Cl.² B66B *1/30*

U.S. Cl. 187—29 R **1 Claim**

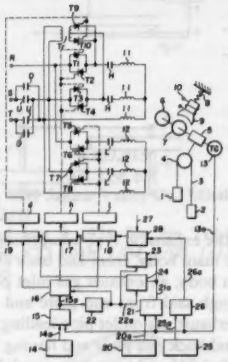
1. A speed control apparatus for an A.C. powered elevator, which comprises:

a multi-speed A.C. motor having a low speed winding and a high speed winding;

thyristor means for applying power to the low speed winding and the high speed winding;

switching means for connecting said thyristor means to either the low speed winding or the high speed winding;

a power running circuit for starting the motor by the low speed winding during acceleration, disconnecting the low speed winding upon reaching the synchronous speed of the low speed winding and then connecting the high speed winding, said power running circuit coupled to said switching means;



a decelerating circuit coupled to said switching means for disconnecting the high speed winding and connecting the low speed winding during deceleration, and for disconnecting the low speed winding upon reaching the synchronous speed of the low speed winding, and then connecting the high speed winding for D.C. braking thereof;

detector means for detecting the slip of said motor and setting an initial value for the firing angle of the thyristor means in accordance with the detected slip when disconnecting and connecting the low speed and the high speed windings, such that the motor produces a continuous torque upon changeover from the low speed and the high speed windings.

4,122,920

DISC BRAKES FOR VEHICLES

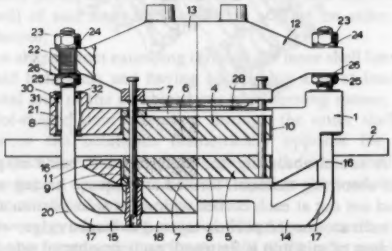
Geoffrey Harvey, Birmingham, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 29, 1977, Ser. No. 828,722

Claims priority, application United Kingdom, Sep. 22, 1976, 39372/76

Int. Cl.² F16D *55/224*

U.S. Cl. 188—73.4 **7 Claims**



1. A disc brake for a vehicle comprising a rotatable disc, first and second friction pad assemblies for engagement with opposite faces of said disc, a stationary drag-taking member strad-

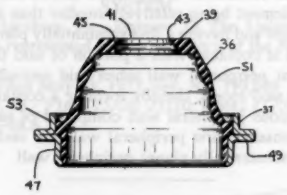
dling the peripheral edge of said disc and having abutments on which said pad assemblies are guided for movement towards and away from said disc, a clamp assembly extending over the peripheral edge of said disc and slidably guided on said stationary member for movement in a direction substantially parallel to the axis of said disc, and actuating means for applying said first friction pad assembly directly to one side of said disc and applying said second friction pad assembly indirectly to said disc by a reaction transmitted to it through said clamp assembly, said clamp assembly comprising first and second pressure plates which are chordal to said disc and have superimposed openings at their outermost ends, said stationary member having openings superimposed with said openings in said pressure plates, and a bolt of U outline interconnecting said pressure plates comprising spaced parallel limbs which pass through said superimposed openings in said pressure plates and said stationary member, and a bridge piece interconnecting said limbs at one pair of adjacent ends and acting on one of said pressure plates, said actuating means acting between said first friction pad assembly and said first pressure plate which is adjacent thereto, and said second pressure plate acting on said second friction pad assembly.

4,122,921

FLEXIBLE SEAL FOR BRAKES

Edward J. Diggs, Stratford-upon Aveon, England, and Karl Grebe, Rodenbach, Fed. Rep. of Germany, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 10, 1977, Ser. No. 850,165
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—79.5 GE **6 Claims**



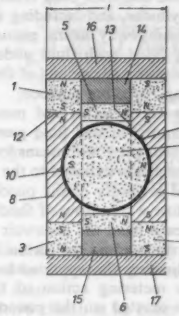
1. In a wedge actuated brake assembly having movable brake shoes adapted to engage a surrounding brake drum: a housing having first and second openings therein; a plunger assembly guided for linear movement in each of said first and second openings and adapted when urged out of said openings to force said shoe toward said drum; a flexible sealing member surrounding each said first and second openings and each said plunger assemblies, said flexible sealing member having a circular metallic body to be received within the end of each of said first and second openings to a depth determined by a radially extending lip formed thereon, said flexible sealing member including a flexible boot bonded at one end to said circular metallic body; said boot being generally in the form of a truncated cone having a radially inwardly facing lip at its end opposite the end of said boot bonded to said circular metallic body; said lip defining a centrally disposed hole therethrough which intimately surrounds and seals about each said plunger assemblies; there being two generally circular lips formed on the radially extending interior portion of said centrally disposed hole to enhance the sealing effect upon said plunger assemblies.

4,122,922

INFINITELY VARIABLE WEAR-FREE EDDY CURRENT AND/OR HYSTERESIS BRAKE, PREFERABLY FOR TRACK-BOUND VEHICLES

Max Baermann, Bensberg-Wulfshof, Postach 26, 5060 Bergisch Gladbach 1, Fed. Rep. of Germany

Filed Aug. 17, 1977, Ser. No. 825,298
Int. Cl.[2] B60L *7/28*
U.S. Cl. 188—267 **14 Claims**



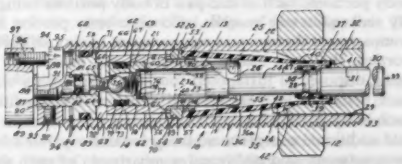
1. An infinitely variable wear-free permanent magnetic eddy current and/or hysteresis brake, preferably for track-bound vehicles, comprising: one or a plurality of similar elements fastened adjacent to each other in the direction of motion, the total permanent magnet volume of each of said elements being composed of turnable and stationary permanent magnets, with the turnable permanent magnet being cylindrical and magnetized in the direction of its diameter, the cylinder axis of said turnable permanent magnet being arranged in perpendicular direction to the surface to be braked, said stationary permanent magnets being elongated and square-shaped in cross section with their greatest length also extending in perpendicular direction to the surface to be braked, each of said elements being provided with pole pieces made from soft iron which on their opposite inner surfaces are provided with arcuate-shaped recesses into which said turnable permanent magnet cylinder projects, said stationary permanent magnets being positioned with one pole facing said pole pieces and with the other pole facing lateral flux return plates so that in switched on position the same poles of said stationary permanent magnets and said turnable permanent magnet cylinder are each adjacent the same pole piece.

4,122,923

ADJUSTABLE HYDRAULIC SHOCK ABSORBER

Larry C. Ellis, Farmington Hills; John S. Ellis, Union Lake, and Russell N. Cossin, South Lyon, all of Mich., assignors to Ace Controls, Inc., Farmington, Mich.

Filed Jul. 11, 1977, Ser. No. 814,167
Int. Cl.[2] F16F *9/342*
U.S. Cl. 188—285 **10 Claims**



1. An adjustable hydraulic shock absorber comprising:
(a) an elongated housing;
(b) a piston cylinder carried in said housing;
(c) a piston movably mounted in said piston cylinder, and

having a piston rod extended out of one end of the housing to receive impact loads, and having a continuous inner end with no passageways through the piston;

(d) a double action flexible, tubular diaphragm positioned in said housing with an inner end secured to the housing and with an outer end secured to the piston rod to form an expandable fluid reservoir;

(e) two-directional fluid passageway means interconnecting said piston cylinder for alternate flow of fluid from the piston cylinder to the fluid reservoir during a shock absorbing operation and then back from the fluid reservoir to the piston cylinder, and including a valve seat means, and said fluid passageway means, piston cylinder and fluid reservoir being filled with fluid under pressure to normally move the piston to one end of the piston cylinder in an initial loading receiving position;

(f) a combination check valve and metering valve means operatively mounted in said fluid passageway means for operation with said valve seat means for metering the flow of fluid from the piston cylinder to the reservoir when the piston is moved inwardly of the piston cylinder under a load, and to allow a free flow of fluid through said fluid passageway means from the reservoir back to the piston cylinder when the load on the piston is removed; and,

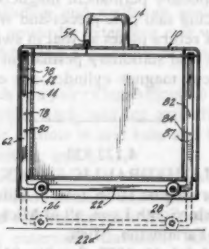
(g) means for adjusting the combination valve means for controlling the metering action of the same, whereby when a load is exerted on the piston rod, the piston is moved inwardly of the piston cylinder to force the fluid in the piston cylinder past the valve means in a metering action and through said passageway means into the reservoir means and said diaphragm is expanded and the speed of the load is controlled, and when the load is removed from the piston rod, the diaphragm contracts to return fluid from the reservoir through the passageway means and past the valve means in a free flow action into the piston cylinder to return the piston to its initial load receiving position.

4,122,924

WHEEL SUPPORTED LUGGAGE

David Wasserman, 1926 Cole Dr., East Meadow, N.Y. 11554

Filed Jul. 28, 1977, Ser. No. 819,759
Int. Cl.[2] A45C 5/14
U.S. Cl. 190—18 A **8 Claims**



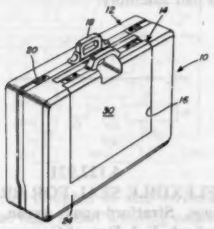
1. A wheel supported luggage apparatus comprising a pair of body portions, each of said pair of body portions being pivotably secured to one another, said each body portion having a compartment therein, said compartment having an open mouth portion, the open mouth portion of said each body portion being disposed in juxtaposed touching relationship when said each body portions are pivoted into a closed condition, said each body portion having an additional compartment therein, said additional compartment being located separated from said compartment, said additional compartment of each said body portion being disposed in aligned relationship with each other when said body portions are disposed in said closed condition, said each additional compartment having an open mouth portion disposed perpendicular to said open mouth portion of said compartment when said body portions are disposed in said closed condition, a pair of U-shaped bars, the legs of said pair of U-shaped bars being disposed in parallel spaced apart relationship and extending parallel to said open mouth portion of said compartments, said U-shaped bars carrying wheels, said wheels rotatably secured to said U-shaped bars along a portion thereof intermediate said legs, said portions of said U-shaped bars being disposed residing in said additional compartments, means to slidably secure said legs to said body portions, said portions of said U-shaped bars being movable outwardly of said additional compartment, means to selectively releasingly engage each said U-shaped bar in selected locations along the slidable path thereof.

4,122,925

COMBINED SUITCASE AND BRIEFCASE

Udo F. Schultheiss, Shramberg, Germany, assignor to Hans R. Mittemeijer, Winston-Salem, N.C.

Filed Dec. 29, 1977, Ser. No. 865,505
Int. Cl.[2] A45C 3/00
U.S. Cl. 190—52 **5 Claims**



1. A container assembly comprising first and second container elements, wherein: said first container element has a first peripheral wall with a portion thereof defining a recess adapted to accept the second container element therein and form a firm releasable engagement therewith; said second container element being relatively smaller than said first container element and having a first substantially planar peripheral wall which is coplanar with a portion of said first container element first peripheral wall when said second container is disposed in said recess, thereby forming a container assembly first continuous peripheral wall composed of said portion of said first container first peripheral wall and said second container first substantially planar peripheral wall.

4,122,926

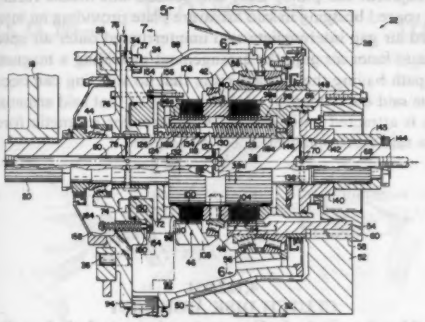
FLUID OPERATED CLUTCH AND BRAKE

Edwin A. Spanke, Oak Forest; Louis F. Carrieri, LaGrange Park, and Melvin H. Francey, Palos Heights, Ala.L OF IL, assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Dec. 2, 1976, Ser. No. 746,732
Int. Cl.[2] F16D 67/02
U.S. Cl. 192—18 A **22 Claims**

1. A press drive mechanism comprising, a housing, shaft means extending through said housing and supported for rotation relative thereto about an axis, a flywheel coaxial with said shaft means and supported for rotation relative thereto and to said housing, clutch disc means cooperatively supported relative to said shaft means and said flywheel, brake disc means cooperatively supported relative to said housing and said shaft means, said brake disc means being axially spaced from said clutch disc means, abutment means fixed on said shaft means between said clutch disc means and brake disc means, a clutch disc presser member, a brake disc presser member, carrier means axially reciprocable between first and second positions relative to said fixed abutment means, one of said clutch and brake presser members being axially fixed on said carrier

means and engaging the corresponding one of said clutch and brake disc means with said abutment means when said carrier means is in said first position, the other of said clutch and brake presser members being axially displaceable with and relative to said carrier means and engaging the other of said clutch and brake disc means with said abutment means when said carrier



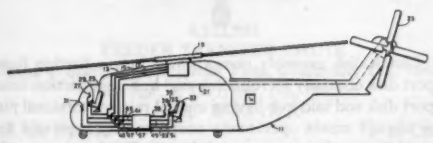
means is in said second position, actuating means for reciprocating said carrier means between said first and second positions, and means selectively operable to position said other presser member to engage said other disc means with said abutment means when said carrier means is in said first position.

4,122,927

DISCONNECT LINKAGE FOR FORCE TRANSMISSION SYSTEM

Alan Berg, Horsham, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 13, 1977, Ser. No. 799,049
Int. Cl.[2] F16D *25/08, 25/10;* G05G *11/00*
U.S. Cl. 192—48.8 **13 Claims**



1. A disconnect linkage for a force transmission system, comprising:

a support;

a shaft slideably journaled in said support;

a plurality of pairs of mating members coaxially and rotatably disposed on said shaft for selective engagement with longitudinal movement of said shaft, respective members of said mating pairs being rotatably connected at spaced intervals to said support and slideably disposed on said shaft, and the other members of said pairs being operatively connected at correspondingly spaced intervals to said shaft for longitudinal movement therewith, each of said pairs of mating members being adapted to be interposed in the force transmission system for disconnectable linking thereof; and

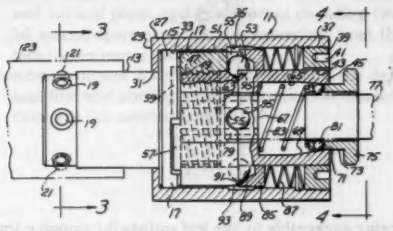
motor means connected to said shaft for selective longitudinal movement thereof.

4,122,928

TORQUE CLUTCH COUPLING

Theodore M. Smith, 39432 W. Archer Dr., Mt. Clemens, Mich. 48043, assignor to Theodore M. Smith Trust, Mt. Clemens, Mich., Lucille G. Smith & Theodore M. Smith, Trustees

Filed Jun. 13, 1977, Ser. No. 805,949
Int. Cl.[2] F16D *43/20*
U.S. Cl. 192—56 R **17 Claims**



1. A torque clutch coupling comprising an elongated torque clutch body adapted for support and rotative drive at one end upon a longitudinal axis;

an axial torque drive clutch at its other end;

a torque case mounted on and enclosing said drive clutch;

an adapter nested within said case coaxial of and spaced from said drive clutch;

said adapter adapted to axially mount a driven member for rotative drive thereof;

a driven torque clutch axially nested and journalled within said case, loosely receiving said adapter and normally connected to said drive clutch;

yieldable means in said case bearing against said driven clutch normally maintaining the driven clutch in operative registry with said drive clutch;

movable drive means on said driven clutch interconnecting said driven clutch and adapter;

said driven clutch adapted for longitudinal movement within said case;

and an adjustable rotative means between and interconnecting said driven clutch and adapter, and including multiple interconnected projections, at least one of said projections lying in an inclined plane at an acute angle to said axis, whereby a torque encountered by said adapter and driven member in excess of a predetermined torque, will effect an automatic longitudinal camming movement of said driven clutch relative to the drive clutch, completely disengaging said driven clutch therefrom, said drive clutch adapted for free rotation with respect to said adapter and driven member.

4,122,929

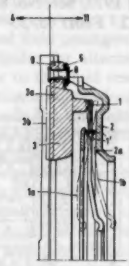
FRICTION CLUTCH, ESPECIALLY FOR MOTOR VEHICLES

Paul Maucher, Sasbach, and Edmund Maucher, Buhl, Baden, both of Germany, assignors to LuK Lamellen und Kupplungsbau GmbH, Buhl, Baden, Germany

Filed Feb. 28, 1977, Ser. No. 772,593
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1976, 2607939
Int. Cl.[2] F16D *13/18*
U.S. Cl. 192—70.18 **10 Claims**

1. Friction clutch including a pressure plate and other components wherein a cup spring, on the one side thereof, is braced against one of the other components of the clutch and, on the other side thereof, loads the pressure plate, transmission of torque between the pressure plate and the one of the other cluch components and lifting of the pressure plate being effected by a plurality of leaf springs which ensure relative movement between the pressure plate and the one of the other clutch components, the movement being effective at least over

the operating travel range of the clutch which amounts to the engagement and disengagement travel and the wear travel of a clutch disk, comprising means projecting into the travel path of the leaf springs for stopping the travel thereof, said stop



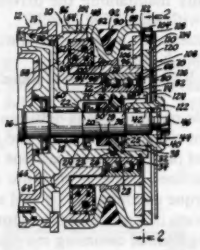
means being engageable by the leaf springs for stopping travel thereof at least when the pressure plate has reached substantially the position thereof corresponding to the maximum wear travel thereof.

4,122,930

ELECTROMAGNETIC CLUTCH

George T. Bennett, Kettering, and Byron L. Brucken, Miamisburg, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 25, 1977, Ser. No. 844,538
Int. Cl.[2] F16D *27/10*
U.S. Cl. 192—84 C **4 Claims**



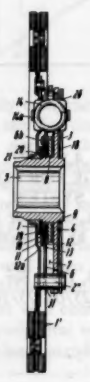
1. For use with an air-conditioning compressor including a casing having a fixed tubular extension extending from an end surface thereof and a drive shaft extending centrally through said tubular extension, with a drive hub secured to said drive shaft, an electromagnetic clutch comprising a coil housing having inner and outer walls, an energizable electromagnetic coil mounted in said coil housing, a bearing mounted around said tubular extension adjacent the end of said inner wall, drive means secured to said drive hub, an armature plate positioned adjacent said drive means on the coil side thereof, spring means secured at one end thereof to said armature plate and at the other end thereof to said drive means for movably supporting said armature plate and driveably connecting said armature plate to said drive means, a pulley operatively mounted intermediate said armature plate and said coil housing and including inner and outer cylindrical end portions and an intermediate groove portion, said inner cylindrical end portion extending freely adjacent said outer wall of said coil housing, said groove portion extending radially inwardly from said end portions, a pulley hub mounted around said bearing, and a non-magnetic member mounted in support relationship between the innermost surface of said groove portion and the adjacent outer surface of said pulley hub to form a pulley assembly in which the outer end portion of said pulley extends freely toward said armature plate, a clutch rotor secured to the end of said pulley hub adjacent said armature plate and extending radially outwardly therefrom so as to provide a radially outer uninterrupted circular air space with respect to the adjacent inner surface of said outer cylindrical end portion of the pulley, first slot means formed with spaced bridging in a radially inner portion of said clutch rotor providing an interrupted inner air gap adjacent the pulley hub, and second slot means formed with spaced bridging in said armature plate providing an interrupted air gap intermediate said uninterrupted outer air space and said inner air gap, the arrangement providing a magnetic flux path having the characteristic that no shorting can occur across said uninterrupted outer air space so that said armature plate is attracted more quickly with stronger magnetic force when said electromagnetic coil is energized.

4,122,931

CLUTCH DISK ASSEMBLY

Paul Maucher, Sasbach, Germany, assignor to LuK Lamellen und Kupplungsbau GmbH, Bühl, Germany

Filed Jul. 28, 1975, Ser. No. 599,856
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1974, 2436288
Int. Cl.[2] F16D *3/14*
U.S. Cl. 192—106.2 **5 Claims**

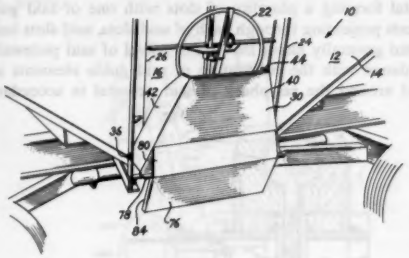


1. Clutch disk assembly comprising a hub, a friction lining support disk coaxially surrounding said hub, said friction lining support disk and said hub having mutual relative torsional play force storage means operatively connected between said hub and said friction lining support disk and effective against relative torsion therebetween, load friction means ineffective over a first given range of torsional play between said hub and said friction lining support disk and effective over a second given range of said torsional play, said load friction means comprising a friction member and friction means effective over said second given range or torsional play, at least one force-storage device compressible over said second given range of said torsional play being effective with said friction means, and a pair of disk-like members disposed in axial spaced relationship on said hub and rigid therewith against relative rotation, said load friction means being disposed in the axial space between said pair of disk-like members, said pair of disk-like members rigid with said hub against relative rotation being formed with recesses defined by respective stop contours located opposite to and in registry with one another, said force storage means comprising respective force storage devices received in said recesses and engageable with said stop contours.

4,122,932
COMBINATION GRAIN DISCHARGE CHUTE CONSTRUCTION FOR DUMP WAGON

Frederic B. Neubert, Seymour, Ill., and Kenneth M. Coldren, Fort Wayne, Ind., assignors to M & W Gear Company, Gibson City, Ill.

Filed Sep. 20, 1976, Ser. No. 724,603
Int. Cl.[2] B65G 11/04
U.S. Cl. 193—5 3 Claims



1. In a hopper-type grain wagon which includes a side discharge door in a sidewall of the wagon, said door having a lower edge, the improvement of a dual direction chute for the side discharge door, said wagon including spaced supports on opposite sides of the hopper door defining a single horizontal pivot axis for attachment of the chute to the wagon, said chute comprising, in combination:

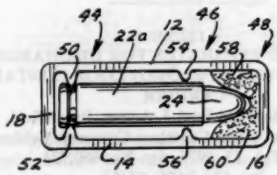
a bottom panel having connected spaced substantially vertical side flanges, each of said side flanges including a pivot connector for attachment with one of the pivot axis supports, each pivot connector being placed in a side flange above the panel bottom and adjacent an edge of the side flange whereby the botom panel is pivotal to a side discharge position and forms a grain slideway from the lower edge of the door, said bottom panel being pivotal to a second position opposed to and spaced from the door, and

a reverse direction panel extending from said bottom panel in the opposite direction from the bottom panel and unitary therewith whereby when said chute is in the second position, the reverse direction panel directs grain discharge from the door to beneath the wagon, said reverse direction panel forming an acute angle with the bottom panel and spaced from the pivot connector a greater perpendicular distance than the bottom panel.

4,122,933
FEEDER TRANSFER CHUTE

Eugene J. Starzyk, 6409 Buena Vista, Greenville, Tex. 75401

Filed Apr. 4, 1977, Ser. No. 784,565
Int. Cl.[2] B65G 11/20
U.S. Cl. 193—32 15 Claims



1. An apparatus for gravitational feeding of elongated substantially identical objects, each object having opposed first and second end portions, and each object being an ammunition cartridge having a forwardly directed projectile at the first end portion and a casing rearwardly of the projectile, said casing including, at the second end portion, means defining an annular extractor groove, said apparatus including:

a chute having walls including generally vertical side walls defining a passageway, a passageway entrance and a passageway exit, each of said objects, when positioned in the entrance in a selected substantially horizontal orientation, descending in a substantially vertical plane by gravity while confined in the passageway to travel toward the exit;

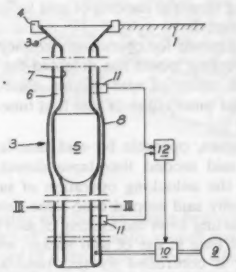
guide means acting upon the object to limit the amount of deviation of the axis of the object from horizontal while permitting the object substantially free fall movement in said vertical plane, said guide means including two parallel spaced-apart extractor ribs extending from the walls into the extractor groove; and

restricting means for continually retarding the descent of said first end portion to hold acceleration thereof to less than free fall acceleration.

4,122,934
APPARATUS FOR DECELERATING DESCENDING BODIES

Pierre A. Nieto de Moreno, Paris, France, assignor to Société Soberal S.A., Luxembourg

Continuation of Ser. No. 593,495, Jul. 7, 1975, abandoned. This application Mar. 10, 1977, Ser. No. 776,186
Claims priority, application France, Jul. 23, 1974, 74 25560
Int. Cl.[2] B65G 11/20
U.S. Cl. 193—32 4 Claims



1. An apparatus for decelerating descending bodies from an elevated location, said apparatus comprising a flexible tubular arrangement extending substantially vertically from said elevated location and secured to a support at said elevated location, said tubular arrangement comprising:

an inner flexible sleeve which is substantially non-extensible in the longitudinal direction, and which extends substantially vertically from said elevated location along the whole length of said flexible tubular arrangement, in order to receive and guide the bodies to be conveyed; and,

at least one extensible chamber for filling with a pressurized gas, said chamber defined by a resilient wall distinct from said inner sleeve, said chamber having an annular shape, surrounding the inner sleeve and being associated with means for regulating the pressure of gas in said chamber so as to apply a retarding force to the body moving inside said inner sleeve, the wall of said chamber being flexible.

4,122,935
SYSTEM FOR CONTROLLING COIN-OPERATED LOCKERS

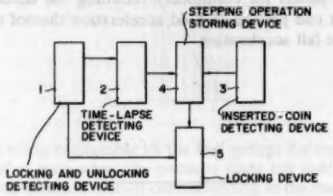
Komei Inoue, and Toshisa Kosaka, both of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Continuation-in-part of Ser. No. 593,042, Jul. 3, 1975, abandoned, which is a continuation of Ser. No. 423,798, Dec. 11, 1973, abandoned. This application Dec. 10, 1976, Ser. No. 749,615

Claims priority, application Japan, Dec. 11, 1972, 47-124583

Int. Cl.[2] G07F 5/02

U.S. Cl. 194—32 **2 Claims**



1. In a coin-operated locker which is locked by the use of a coin and is unlocked by a key which is lent to a user when the locker is locked, a system for controlling said coin-operated locker, said system comprising:

(a) lock mechanism for locking and unlocking said coin-operated locker;

(b) locking detecting means for detecting the fact that said locker has been locked;

(c) a first time-lapse detecting means comprising a timer roller which makes one revolution per a predetermined period of time;

(d) a second time-lapse detecting means comprising a roller which when said locker has been locked is connected to and turned by said timer roller of said first time-lapse detecting means, and a switch for detecting the fact that said roller has rotated for said predetermined period of time starting from the locking of said locker, to produce a time-lapse signal;

(e) connecting means for operatively connecting, when said locking detecting means has detected the locking of said locker, said roller of said second time-lapse detecting means to said timer roller of said first time-lapse detecting means; and

(f) locking means, operable by said time-lapse signal produced by said second time-lapse detecting means, for preventing the unlocking operation of said lock mechanism, whereby said second time-lapse detecting means is operated starting from the locking of said locker to detect the lapse of time in use of said locker, and unlocking of said locker is controlled by said time-lapse signal produced by said second time-lapse detecting means.

4,122,936
CENTERING MECHANISM FOR MOVABLE MEMBER WITHIN A VARIABLE-WIDTH PASSAGEWAY

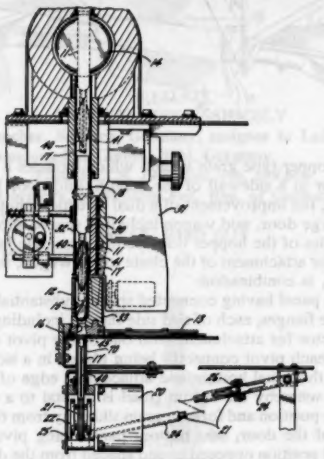
James F. Johnson, LaGrange Park, Ill., assignor to Packard Instrument Company, Inc., Downers Grove, Ill.

Filed Mar. 21, 1977, Ser. No. 779,367

Int. Cl.[2] B23Q 7/00

U.S. Cl. 198—339 **6 Claims**

1. In a benchtop scintillation counter having a vertical well through which sample vials are transported between a cassette holding a row of sample vials and an overhead counting chamber by an elevator pedestal, said cassette having a hole beneath each vial that is small enough to prevent the vial from passing therethrough but large enough to allow passage of said elevator pedestal therethrough, a transverse dimension of said well varying along the length thereof with at least a portion of said well having a transverse dimension significantly greater than that of said pedestal, means for advancing and retracting said pedestal through said cassette and vertical well, a mechanism for centering said pedestal within said well comprising the combination of a plurality of smooth resilient guide elements secured within said pedestal, said guide elements being oriented generally along the axis of travel of said pedestal and bowed outwardly from said pedestal by at least one biasing means within said pedestal for continuously engaging the walls of said well and urging said pedestal toward the center of said well regardless of the transverse dimension of said well, said pedestal forming a plurality of slots with one of said guide elements projecting through each of said slots, said slots being oriented generally along the axis of travel of said pedestal in accordance with the orientation of said guide elements and spaced around the periphery of said pedestal in accordance



with the spacing of said guide elements, the width of said slots being slightly greater than the width of said guide elements, and the length of said slots being slightly greater than the length of said guide elements, for allowing said guide elements to be compressed fully within said slots and for providing lateral support for said guide elements as they flex in and out of said slots, the transverse dimension of at least a portion of said well varying abruptly along the length thereof with the bowing of said guide elements being sufficient to allow easy passage of said pedestal past said abruptly-varying portion, at least part of said well being formed by at least two hollow segments separated by a gap with the length and bowing of said guide elements being sufficient to allow easy passage of said pedestal past said gap and to keep said pedestal approximately centered as it enters and leaves each of said hollow segments.

4,122,937
METHOD AND APPARATUS FOR DISCHARGING CONTAINERS FROM A CLOSED LOOP CONTAINER CARRIER

Peter Vischer, Golden, and Paul J. Artzer, Broomfield, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Feb. 23, 1976, Ser. No. 660,723

Int. Cl.[2] B65G 47/52

U.S. Cl. 198—408 **20 Claims**

1. Apparatus for discharging bottle type containers or the like from a moving closed loop container carrier having a multiplicity of parallel longitudinally and transversely aligned rows of container baskets for supporting containers in the container carrier with each container basket being longitudinally and transversely offset from adjacent container baskets in adjacent longitudinal and transverse rows, and conveying the

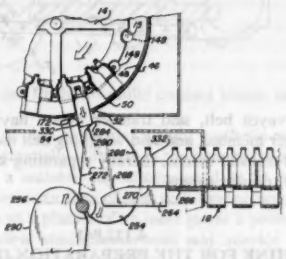
containers to a remote point for further processing, comprising:

means for inverting a portion of the container carrier to allow containers in the container baskets of the inverted portion to slide therefrom,

a first discharge conveyor,

a second discharge conveyor,

a first container transfer means for receiving containers from alternate transverse rows of container baskets and transferring the received containers to the first discharge conveyor,



a second container transfer means for receiving containers from the other alternate transverse rows of container baskets and transferring the received containers to the second discharge conveyor, and

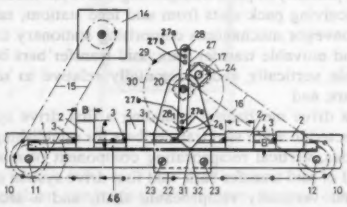
means for supporting containers substantially within the container baskets of the inverted portion of the container carrier and allowing containers within alternate transverse rows of container baskets to slide out of the container baskets and into the first container transfer means and containers within the other alternate transverse rows of container baskets to slide out of the container baskets and into the second container transfer means.

4,122,938

APPARATUS FOR TOPPLING CONVEYED ARTICLES

Theo Walz, Neunkirch, and Fritz Glauser, Neuhausen am Rheinfall, both of Switzerland, assignors to S I G Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Jul. 5, 1977, Ser. No. 812,522
Claims priority, application Switzerland, Jul. 2, 1976, 8519/76
Int. Cl.[2] B65G 47/24
U.S. Cl. 198—411 **10 Claims**



1. In an apparatus for toppling stacks of conveyed articles of rectangular outline having opposite long sides and opposite short sides; the apparatus having a travel surface; a discontinuity in the travel surface; a first carrier means including article-engaging first carrier rods traveling at a distance above and along the travel surface and extending generally parallel to the travel surface and transversely to the direction of travel for advancing the article stacks by sliding the articles, on one of their short sides, on the travel surface up to the discontinuity and for advancing the articles by sliding them, on one of their long sides, on the travel surface from a point downstream of the discontinuity; the improvement comprising a second carrer means having

(a) at least one second carrier rod extending generally parallel to said first carrier rods above said travel surface;

(b) means for moving said second carrier rod in an endless path having an effective path portion extending in a zone above said discontinuity; said second carrier rod engaging each article of successive article stacks as said second carrier rod moves in said effective path portion; said second carrier rod, at least during its motion along said effective path portion, being located at a greater distance above said travel surface than said first carrier rods; and

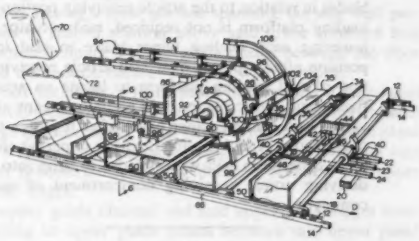
(c) means for moving said second carrier rod, at least along said effective path portion, at a greater speed than the speed of said first carrier rods for effecting a takeover of article advance by said second carrier rod from the respective first carrier rod in the zone of said discontinuity for effecting, in cooperation with said discontinuity, a simultaneous toppling of the articles of the respective stacks on said travel surface to assume a lying position in which the articles engage said travel surface with one of the long sides thereof.

4,122,939

LOAD TRANSFER MECHANISM FOR PACKAGING MACHINE

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Continuation of Ser. No. 663,092, Mar. 2, 1976, abandoned, which is a continuation of Ser. No. 543,023, Jan. 22, 1975, abandoned, which is a division of Ser. No. 434,043, Jan. 17, 1974, Pat. No. 3,879,920. This application Oct. 3, 1977, Ser. No. 838,983
Int. Cl.[2] B65G 19/02
U.S. Cl. 198—482 **1 Claim**



1. In a packaging machine having a first conveyor for conveying a plurality of longitudinally spaced apart article receiving compartments of a fixed size through a loading station to receive size variable articles, the improvement of;

(a) said first conveyor having a loading run extending through said loading station in a first plane with said article receiving compartments opening upwardly therefrom; and

(b) loading means comprising;

(i) a loading platform disposed above said first conveyor and extending parallel to a portion of said loading run of said first conveyor in a second plane disposed to prevent slippage of said articles therealong due to gravitational forces applied to said articles, said loading platform having a discharge edge at one end thereof, the article receiving compartments moving forwardly from said discharge edge as they emerge from below said platform and travelling along said loading run,

(ii) a second conveyor disposed above said platform and having a length extending in a third plane parallel to said first plane for movement in the direction of movement of the first conveyor,

(iii) a plurality of wiper blade sets mounted at longitudinally

spaced apart intervals on said second conveyor for movement with said second conveyor in the direction of the path of travel of said compartments through said loading station, the movement of the wiper blade sets being synchronized with the movement of the compartments so that each wiper blade set will open into a compartment as a compartment emerges from said discharge edge of said platform, each of said wiper blade sets comprising a leading wiper blade and a trailing wiper blade which extend downwardly towards said first conveyor during their movement in the direction of movement of said second conveyor through said loading station, each leading wiper blade being mounted for movement between a first elevated position in which it will pass over an article located on said loading platform and a second lowered position in which it extends downwardly in a face-to-face relationship with respect to its associated trailing wiper blade,

(iv) a dispenser means for substantially randomly dispensing articles one at a time onto an article receiving portion of said loading platform such that an article may be dispensed onto said receiving portion at any time after the passage of a trailing wiper blade from said article receiving portion until the arrival of a subsequent trailing wiper blade at said article receiving portion of said loading platform,

(v) actuator means for elevating and lowering each leading wiper blade as it passes through said loading station, said actuator means being adapted to elevate each leading wiper blade before it arrives at said article receiving portion of said platform, and maintaining it in said elevated position so that there is an unrestricted space between successive trailing wiper blades to admit an article to said receiving portion of said platform at any time after the passage of a trailing wiper blade beyond said article receiving portion of said platform such that precise synchronization of the dispensing of articles onto said platform and positioning of each set of wiper blades in relation to the article receiving portion of said loading platform is not required, said actuator means lowering each leading wiper blade to said lowered position after it passes over said article receiving portion of said loading platform to locate an article between said wiper blades, said actuator means also elevating said leading wiper blade after it passes the discharge edge of said loading platform to permit an article located between said wiper blades to drop into an underlying article receiving compartment of said first conveyor.

4,122,940

APPARATUS FOR THE WEIGHING OF MASS PRODUCED ARTICLES

Wilhelm Hoffmann, Schwarbisch Hall, Fed. Rep. of Germany, assignor to Optima-Maschinenfabrik, Dr. Buehler KG, Fed. Rep. of Germany

Filed Nov. 3, 1976, Ser. No. 738,503

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2548988

Int. Cl.[2] B65G *69/00*

U.S. Cl. 198—504 **17 Claims**

1. Apparatus for weighing mass produced articles shortly after formation of said articles, comprising:

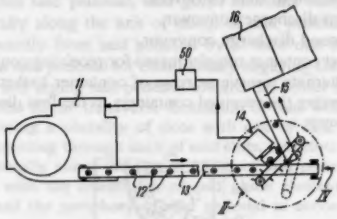
a weighing cell for measuring the weight of each of said articles;

a continuously moving weighing belt, supported by and connected to said weighing cell, for supporting each of said articles when weighed;

a delivery conveyor belt for continuously transporting said articles to said weighing belt;

a removal conveyor belt for continuously transferring said articles away from said weighing belt, running at an angle to said delivery conveyor belt, said weighing cell being interposed in the space formed by said angle; and

means extending over said delivery conveyor belt, said removal conveyor belt and said weighing belt for transferring said articles from said delivery conveyor belt to said weighing belt and from said weighing belt to said removal



conveyor belt, said transfer means having at least one finger member, and said weighing belt moving faster than said transfer means, thereby separating said articles from said transfer means.

4,122,941

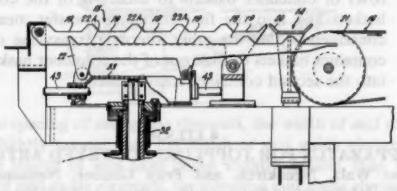
MACHINE FOR THE PREPARATION OF PACKS OF ARTICLES OF A PRE-DETERMINED WEIGHT

Alan F. Giles, Welwyn Garden City, England, and Albertus G. Hendriks, Vlaardingen, Netherlands, assignors to Internationale Octrooi Maatschapplj "OCTROPA" B.V., Rotterdam, Netherlands

Filed Mar. 23, 1977, Ser. No. 780,791

Int. Cl.[2] B65G *25/02, 47/10;* G01G *13/34*

U.S. Cl. 198—774 **2 Claims**

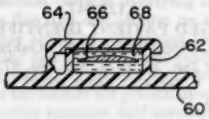


1. For use in a machine having a plurality of feed stations at which individual pack units are supplied to the machine, a feeding mechanism for providing selective shifting of said pack units away from said feed stations, said feeding mechanism comprising:

(a) a plurality of pack transporting conveyor mechanisms for receiving pack units from said feed stations, each of said conveyor mechanisms comprising stationary carrier bars and movable transfer bars, said transfer bars being movable vertically and horizontally relative to said carrier bars; and

(b) a drive mechanism including a first drive system connected to all of said transfer bars for establishing a continuous, vertical reciprocating component of movement of all of said transfer bars, said first drive system including a first vertically reciprocable shaft, and a second drive system connected to all of said transfer bars for independently establishing a horizontal reciprocating component of movement of the transfer bars at selected ones of the conveyor mechanisms, said second drive system including a second shaft concentric with said first shaft, said second shaft being capable of rotary movement relative to said first shaft to provide the horizontal reciprocating component of movement at selected ones of the conveyor mechanisms, said first and second drive systems operating in synchronism to establish a pack unit-shifting elliptical movement of transfer bars only at selected conveyor mechanisms.

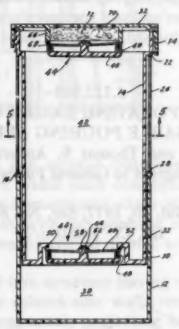
4,122,942
HYDROPHILIC CONTACT LENS CASE
Leonard G. Wolfson, 15 Varick Rd., Newton, Mass. 02168
Division of Ser. No. 438,443, Jan. 31, 1974, abandoned. This application Jul. 21, 1975, Ser. No. 597,591
Int. Cl.[2] A45C *11/04*
U.S. Cl. 206—5.1 3 Claims



1. A storage case for hydrophilic contact lenses, said cases comprising;

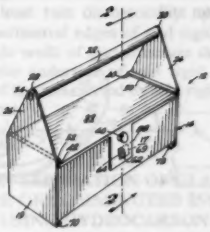
a well formed of high molecular weight synthetic polymeric material substantially softer than the material of said lens, and having a sealable cap dimensioned to fit over said well, the interior surface of said well having been treated by exposure to a plasma of an inert gas at a pressure substantially below atmospheric until said interior surfaces have been rendered hydrophilic.

4,122,943
VALVED TWO COMPARTMENT DISPENSING CONTAINER
Jules Silver, Norwich, and Jerome Silverstein, North Franklin, both of Conn., assignors to Jules Silver, Norwich, Conn.
Filed Oct. 21, 1976, Ser. No. 734,609
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—221 14 Claims



1. A container comprising a first open topped container element and a second container element having closed upper and lower ends and dimensioned to be received with its lower end within said open topped container element, one way valve means in said lower end of said second container element for permitting fluid to flow in only one direction between said containers from said first container element into said second container element; said second container element including one way valve means in its upper end for permitting fluid to flow in only one direction from said second container element to escape from said second container element to the atmosphere when the pressure in said second container element is above a predetermined level.

4,122,944
TOOL BOX
Vincent De Napoli, 1821 NW. 108 Ave., Pembroke Pines, Fla. 33026
Filed Oct. 25, 1977, Ser. No. 844,589
Int. Cl.[2] B65D *43/12*
U.S. Cl. 206—349 4 Claims



1. A tool box comprising:

a pair of opposed end wall portions of common size in confronting relation, each of said end portions having an inner face and an outer face and a lower edge,

said end wall portions each having parallel side edges extending vertically upwardly from said lower edge a common distance to a first predetermined height and said edges extending in converging relation to one another above said predetermined height to an apex,

each of said inner faces having an upper guide channel extending outwardly in perpendicular relation of said faces at said predetermined height, and extending across said inner faces between the respective side edges,

each of said inner faces having a lower inturned foot portion at said lower edge,

said box having a floor portion spanning the side wall portions in spaced relation above said lower inturned foot portion defining a lower guide means between the floor and the foot on each of said end wall portions,

said box including a front panel portion and a rear panel portion, each of said panel portions having an upper panel edge and said upper panel edges being in a common plane at a second predetermined height slightly less than said first predetermined height, defining between said upper panel edges,

said upper guide channel and said upper panel edges comprising an upper guide means between said upper panel edges and said upper guide channels,

said box including a lid, and

said lid being sized to span the end wall portions and panel portions and being of a thickness sized for sliding receipt in said upper and lower guide channel means, and

said lid including a downwardly extending tab normally overlaying said front panel, said tab including handle means, and said lid being adapted to be slidably removed from said upper guide means by said handle and rotated through 180° and reinserted into said lower guide means for storage, and

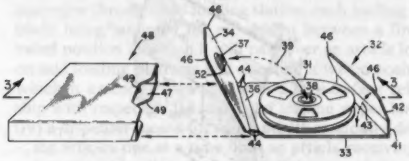
said box including handle means spanning the apexes of said end wall portions for carrying said box.

4,122,945
TAPE REEL CONTAINER
Robert A. Borzak, Opelika, Ala., assignor to Ampex Corporation, Redwood City, Calif.
Filed Apr. 5, 1978, Ser. No. 893,287
Int. Cl.[2] B65D *5/38, 85/67*
U.S. Cl. 206—395 5 Claims

1. In a reel container of the type including an outer carton having one open side, and being cut away adjacent said open side to facilitate grasping an insert member slidable into said open side of said carton, said member being formed with a first

spine and two first and second cover flaps extending therefrom and adapted to mount said reel by means of opposed spindle portions projecting from said flaps and into the hub opening of said reel on opposite sides of said reel, and a spine of said insert member being positionable as a closure for said open side of said carton, the combination comprising:

a second spine for said insert member, said first flap being attached to said second spine for hinged motion with respect thereto; and



a third flap hingedly attached to said second spine opposite said first flap;

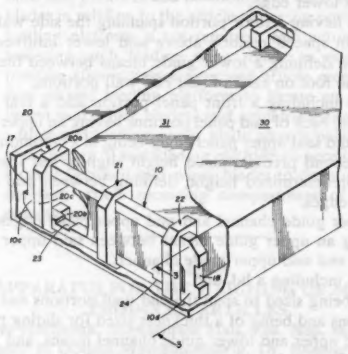
said third flap being of a size smaller than said first flap but still sufficient to close the adjacent cut-away portion of said carton, so that said third flap may be withdrawn to disclose the identity of the reel without the need for withdrawing the entire insert member.

4,122,946

INTERFITTING SHIPPING PAD

Ronnie E. Holley, Garland, Tex., assignor to Lane Container Company, Dallas, Tex.

Filed May 18, 1977, Ser. No. 798,159
Int. Cl.[2] B65D *81/10*
U.S. Cl. 206—523 **3 Claims**



1. A shock resistant shipping pad for packing an article in a transport container comprising:

a frame having parallel top and bottom members integrally joined to perpendicularly disposed first and second end members to define an aperture complementing an outer surface of the article;

said frame top member having a plurality of transverse grooves disposed at spaced points along a top surface of said frame top member;

said frame bottom member having a plurality of transverse grooves disposed at spaced points along a bottom surface of said frame bottom member opposite said transverse grooves of said frame top member; and

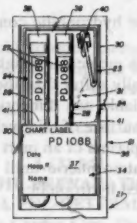
a plurality of cross members for providing lateral shock resistance to the article, each cross member having upper and lower ends and transversing said aperture defined by said frame members, such that said cross member upper ends of said plurality of cross members engage and interlock with said frame top member transverse apertures and said lower ends of said plurality of cross members engage and interlock with a corresponding frame bottom member transverse aperture to permit the outer surface of the article to contact said frame members and said plurality of cross members to provide three dimensional shock resistance to the article within the transport container.

4,122,947

PRE-PACKAGED PATIENT IDENTIFICATION KIT

Marjorie B. Falla, 3056 California St., Oakland, Calif. 94602

Filed Jan. 27, 1978, Ser. No. 873,008
Int. Cl.[2] A61B *19/02*
U.S. Cl. 206—569 **11 Claims**



1. A pre-packaged patient identification kit for use in assuring correlation between a patient and his specimens during patient treatment comprising:

package means;

wristband means formed for secure attachment to a patient, said wristband means being provided with patient identification indicia previously affixed thereto in a tamper-resistant manner;

at least one specimen container means formed for receipt of a specimen taken from said patient, said specimen container means being provided with patient identification indicia previously affixed thereto in a tamper-resistant manner; and

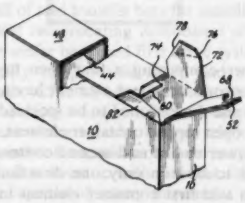
each said patient identifying indicia being identical, and said wristband means and said specimen container means being removably positioned in said package means.

4,122,948

CARTON INCORPORATING EASILY OPENABLE AND RECLOSABLE POURING APERTURE

Harold R. Grieve, and Thomas S. Andersen, both of Battle Creek, Mich., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,307
Int. Cl.[2] B65D *5/54*
U.S. Cl. 206—622 **11 Claims**



1. A carton providing for a reclosable pouring aperture comprising side and end wall panels, pivoted extensions on said panels forming flaps for closing said carton, said closing flaps including outer and inner top closure flaps each extending from a respective side wall panel and dust flaps each extending

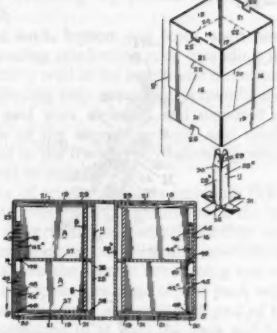
from a respective end wall panel and underlying said closure flaps, the inner of said top closure flaps having weakening lines thereon running serially from one to another free edge thereof forming a severable end section in the corresponding end area of said flap, the dust flap underlying said end section being adhesively-bonded thereto and shaped in conformance therewith, the outer of said top closure flaps having a weakening line running from its pivoted edge transversely across the flap forming an end section thereon overlying the end section of said inner closure flap, the end section on said outer closure flap being severable along its weakening line for pivotal upward movement, the end section of said inner closure flap and dust flap adhesively-bonded thereto being severable along the weakening lines of the former for pivotal upward movement so as to form said pouring aperture, said aperture being reclosable by downward pivotal movement of said end sections and tucking of a free edge of the end section of said outer closure flap below an end area of said inner closure flap bordering its severable end section.

4,122,949

ROLL HOLDING CARTON

David H. Blatt, Elkins Park, Pa., assignor to Franklin Container Corporation, Philadelphia, Pa.

Filed Sep. 2, 1977, Ser. No. 830,034
Int. Cl.[2] B65D *85/02, 85/67*
U.S. Cl. 206—303 **10 Claims**



1. In a shipping and storage container for rolls of sheet material of uniform width each convoluted about a hollow center core with the opposite side edges of the material respectively disposed flush with the opposite ends of said core in spaced parallel planes extending normal to the axis of the roll, in combination,

a. an open-ended box structure having vertically extending right-angularly related side walls respectively provided with integral oppositely projecting hinged closure flaps, said closure flaps being inwardly folded relative to their associated side walls to provide at each of the opposite ends of said box structure overlapping closure flaps extending normal to the side walls of the box structure thereby providing the latter with double-ply top and bottom closure walls,

b. a post member centrally disposed in said box structure and extending vertically between said closed top and bottom walls thereof and projecting through the hollow center core of said rolls,

c. means interlocking each of the opposite ends of said post member in fixedly secured position between said overlapping pairs of box closure flaps, and

d. at least one centrally apertured rigid flat-surfaced member underlying and flat-wise supporting the full circle of convolutions of one of said rolls of convoluted material and at least a portion of the center core thereof thereby maintaining intact the integrity of the roll against telescoping or other distortion of its convolutions, said rigid member being of an overall dimension large enough so as to prevent its radial displacement within said enclosure structure and being of an external perimetral outline sufficiently different from that of the enclosing side walls as to provide at least two diametrically opposed spaces between the perimetral edges of said rigid member and the enclosing side walls of said structure through which one may grasp the underside of said rigid member for axial movement of the roll carried by said rigid member onto or from said post.

4,122,950

FLOTATION SEPARATION OF GLASS FROM A MIXTURE OF COMMINUTED INORGANIC MATERIALS USING HYDROCARBON SULFONATES

William R. White, Upland, and Gary P. Van Tighem, Ontario, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 634,640, Nov. 24, 1975, abandoned.
This application Sep. 22, 1977, Ser. No. 835,792
Int. Cl.[2] B03B *7/00*
U.S. Cl. 209—12 **24 Claims**

1. In a process for separating glass from a particulate mixture of substantially inorganic materials which comprises subjecting a particulate mixture of inorganic materials having a particle size between about 325 mesh and about 20 mesh and containing, as a portion thereof, a quantity of particulate glass particles comprising glasses having the composition of from about 70 to about 73 percent by weight SiO_2, from about 11 to about 18 percent by weight Na_2O, from about 7 to about 17 percent by weight CaO, the balance being essentially other metal oxides to froth flotation with a beneficiating collector reagent in an amount sufficient to form a float fraction comprising predominately particulate glass and an inorganic tailing substantially free of particulate glass, and wherein at least a portion of said particulate mixture of inorganic materials, exclusive of the particulate glass particles, is nonresponsive to the beneficiating action of the collector reagent to cause the particulate glass particles to concentrate in the float fraction, the improvement which comprises activating the surface of the particulate glass particles with at least one metal ion selected from metals of groups II*a*, III*b*, and VIII of the Periodic Table and wherein the metal ion is divalent or trivalent state and using as the collector reagent a beneficiating amount of at least one water compatible sulfonated hydrocarbon containing at least 5 carbon atoms, the activation of the glass particles and the flotation occurring at a pH where the metal ion chemically associates with the glass particles.

4,122,951

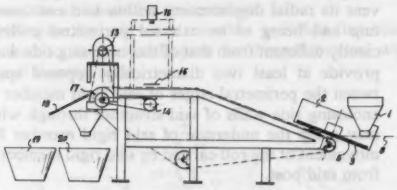
MACHINE FOR THE AUTOMATIC DETECTION OF BLEMISHES IN OLIVES AND OTHER FRUITS

Jose I. L. Alaminos, Avda. Manuel Siurot No. 3, Sevilla, Spain

Filed Feb. 28, 1977, Ser. No. 772,988
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—545 **7 Claims**

1. A machine for the automatic detection of blemishes in olives and other fruits, comprising: a hopper for the reception of the fruit, feed apparatus supplied by said hopper and including a container having a base with a line of orifices said feed apparatus including a rotary disc containing radial rows of orifices on which the olives are deposited in such a manner that with rotation of said disc each of the rows upon alignment with the row of orifices in said base allows the olives or pieces of fruit to fall therethrough, an endless belt constituted by a series of rollers that present a series of longitudinal lanes formed by dividing elements, the olives falling upon said belt and being transported to an observation zone, a television camera situ-

ated at the observation zone, means for causing the rollers to turn when they advance through the said zone, electronic means responsive to said television camera for transforming the video signal obtained with the television camera into an



electrical signal, means responsive to said electronic means for the expulsion of the blemished fruit or olives, said expulsion means causing said blemished olives to be directed to a container different from that for the collection of unblemished olives.

4,122,952

PHOTOMETRIC SORTERS

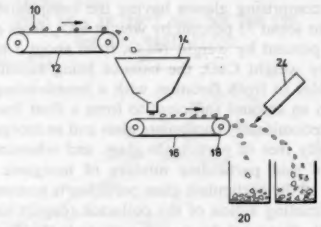
Arthur W. Richards, Bulleen, Australia, assignor to Sphere Investments Limited, Nassau, The Bahamas

Filed Oct. 19, 1976, Ser. No. 733,843

Claims priority, application Australia, Apr. 26, 1976, 2481/76

Int. Cl.[2] B07C *5/342*

U.S. Cl. 209—579 **9 Claims**



1. In a method of sorting objects which includes the steps of passing each object through an area divided into zones and examining the object for a predetermined characteristic in each of the zones into which the object extends, the improvement of quantizing each zone into a predetermined number of spaced regions, generating a first series of signals corresponding to the regions into which the object extends, generating a second series of signals corresponding to the regions in which the predetermined characteristic is detected, and comparing the two sets of signals to produce a reference signal for attributing the characteristic to predetermined regions into which the object extends.

4,122,953

METHOD AND APPARATUS FOR GRADING ARTICLES

Richard M. Brook, Kirkheaton, Huddersfield, England, assignor to Auto Systems Limited, Yorkshire, England

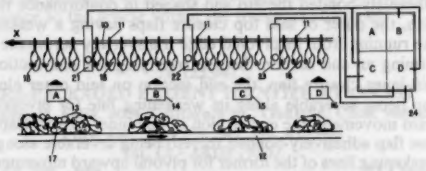
Filed Aug. 29, 1977, Ser. No. 828,687

Claims priority, application United Kingdom, Sep. 7, 1976, 36952/76

Int. Cl.[2] B07C *7/00*

U.S. Cl. 209—551 **9 Claims**

1. A method of associating one of at least two grades with each of a plurality of articles which are to be fed in succession along a path, comprising feeding one grade of article into the path at a first feed station, for movement along the path, feeding a second grade of article into the path at a second feed station arranged upstream of the first feed station, so that only grades of articles other than the one grade travel along the path from the second feed station to the first feed station but after the first feed station all grades of article travel along the path, arranging a first sensor between the first feed station and the second feed station, the first sensor being arranged to emit



a signal each time an article passes the first sensor and having means to associate each signal with the article which generates the signal, and utilising the signals to associate grades with the articles.

4,122,954

ELEVATED TRAY DISPLAY DEVICE

John R. Slater, East Brunswick, N.J., assignor to Loew's Theatres, Inc., New York, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,159

Int. Cl.[2] A47F *3/14*; A47G *1/24*; A47F *5/12*

U.S. Cl. 211—133 **7 Claims**

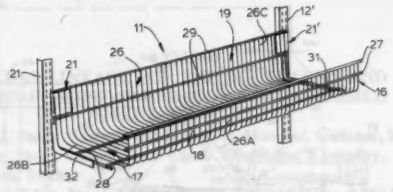
1. An elevated tray display device comprising a base having a lower vertical post and an upper vertical post, the upper post being received in telescoping relation on the lower post for adjustment of the height and rotational orientation of the upper post relative to the lower post, and having means for affixing the upper post to the lower post at a selected height and selected rotational orientation; a tray-mounting plate; means for attaching the plate to the top of the post in a selected one of a multiplicity of orientations and locations relative to the post including a projecting key-type lug on the post, a multiplicity of slots, each of which matches the lug, on the plate, and releasable fastener means for affixing the plate to the post with a selected slot on the plate receiving the lug; a tray adapted to receive products for dislay; and means mounting the tray on the plate in a selected one of an infinite number of locations within spaced-apart limit positions along at least one axis transverse to the vertical.

4,122,955

DISPLAY SHELVING

Harry Celms, Battle Creek, Mich., assignor to Roblin Industries, Inc., Battle Creek, Mich.

Filed Jun. 22, 1977, Ser. No. 809,026
Int. Cl.[2] A47F 5/12
U.S. Cl. 211—126 **3 Claims**



1. In a shelf unit which extends between and is supported in a cantilever manner on a pair of horizontally spaced and vertically extending uprights having vertically spaced slots therein, said shelf unit including:

an upwardly opening basket-like shelf of wire rod construction and including back, bottom and front walls;

said shelf including a plurality of horizontally spaced and substantially parallel wire elements extending transversely thereof, each said wire element being of an upwardly opening channel-shaped configuration and including a front vertically extending leg portion forming a part of said front wall, a bottom substantially horizontal portion forming a part of said bottom wall, and a rear substantially vertically extending leg portion forming a part of said back wall;

each of said back, bottom and front walls have longitudinally extending reinforcing rods extending lengthwise of the respective wall in the lengthwise direction of the shelf, said reinforcing rods extending perpendicularly with respect to said wire elements and disposed adjacent the outer side of the respective wall, said reinforcing rods being fixed to the transversely extending wire elements at their points of engagement;

said plurality of reinforcing rods including first and second reinforcing rods fixedly associated with the back wall and disposed in vertically spaced relationship, said first reinforcing rod being spaced vertically upwardly a substantial distance above the second reinforcing rod and disposed adjacent the upper free edge of said back wall;

support means disposed adjacent each end of the shelf and fixedly connected to at least the back and bottom walls, said support means including a support rod extending transversely of the shelf and having a vertical leg portion fixed to the back wall and disposed rearwardly of the reinforcing rods and a horizontal leg portion fixed to the bottom wall, said support rod being engaged with and fixedly connected to the reinforcing rods associated with said bottom and back walls, said reinforcing rods of said bottom and back walls being sandwiched between said support rod and said transversely extending wire elements; and

a pair of removable mounting brackets coacting between the opposite ends of said rear wall and said pair of spaced uprights for connecting said shelf to said uprights, each of said mounting brackets having a pair of vertically spaced, downwardly opening hooks associated therewith for engagement with the respective upright, comprising the improvement wherein:

at least one rod-like retainer wire is fixedly associated with said back wall adjacent each end thereof and spaced inwardly from the adjacent support rod, said retainer wire extending transversely between and being fixedly connected to said first and second reinforcing rods, said retainer wire being disposed rearwardly of said first and second reinforcing rods so as to engage some on the same side thereof as said support rod, whereby said first and second reinforcing rods are sandwiched between the transversely extending wire elements on one side thereof and the support rod and the retainer wire on the other side thereof, thereby defining a narrow but tall guide channel which extends horizontally and opens outwardly through the adjacent end of the back wall; and

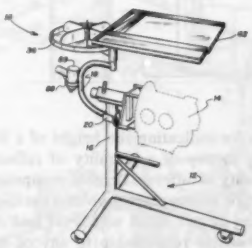
each said mounting bracket consisting solely of an L-shaped one-piece bracket member of integral construction and having first and second vertically planar plate-like flat legs which extend horizontally substantially at a right angle with respect to one another, said bracket member including said first and second legs having a vertical height which is only slightly less than the vertical spacing between said first and second reinforcing rods, said first leg being of relatively short horizontal length and having said hooks projecting outwardly therefrom for engagement with the slots formed in one of said uprights, said hooks being coplanar and integral with said first leg, said hooks also being positioned closely adjacent the upper and lower edges of said first leg so as to be vertically spaced a substantial distance apart, the second leg having a horizontal length which is substantially greater than the length of said first leg and which is at least of similar magnitude to the vertical height of the bracket member, said second leg being solely slidably engaged with said shelf and horizontally slidably confined within said narrow guide channel, said second leg when disposed within said narrow guide channel being closely confined on the front side thereof by the rear vertical leg portions of at least two of said wire elements and being closely confined on the rear side thereof by the vertical leg of said support rod and said rod-like retainer wire, whereby said second leg is solely slidably movable within said channel in the lengthwise direction of the back wall, and said second leg having a horizontally elongated upper edge disposed in slidable bearing engagement with the lower portion of the rounded outer peripheral surface of said first reinforcing rod when said shelf is supported in a cantilever manner on said uprights.

4,122,956

TOOL HOLDER APPARATUS FOR A WORKSTAND

Maxie G. Hargrove, Irving, Tex., assignor to B & H Automotive, Dallas, Tex.

Filed Jul. 25, 1977, Ser. No. 818,459
Int. Cl.[2] A47F 3/14
U.S. Cl. 211—131 **3 Claims**



1. A tool and hardware holder apparatus for attachment to a workstand adapted to support an engine to be assembled or disassembled, which comprises:

a support arm having clamp means on the lower end to be affixed onto the workstand to extend above the workstand, and further including a vertically disposed spindle on the upper end;

a lower swivel arm having a collar on one end for receiving said spindle to pivotally mount said lower arm thereon for movement in a horizontal plane; said lower arm having a

vertically disposed spindle on the end thereof opposite said collar;

a lower tray having a collar for receiving the spindle on the end of said lower swivel arm to provide for rotational movement of said tray about said spindle, said tray having a plurality of bins to hold separate items of hardware for the engine;

a spacer sleeve placed around said support arm spindle above the collar on said lower swivel arm;

an upper swivel arm having a first collar on one end for receiving the upper portion of said support arm spindle extending through said spacer sleeve to pivotally mount said upper arm for movement in a horizontal plane, said upper arm having a second collar on the opposite end;

an upper tray having a shaft affixed to its underside for insertion into the second collar on said upper arm to provide rotational movement thereof, said tray having a compartment for holding tools required in assembling or disassembling the engine; and

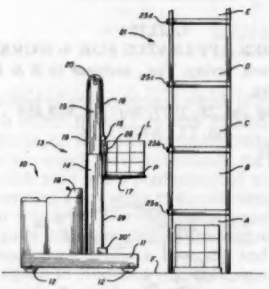
a strap affixed to said holder apparatus defining an opening of a predetermined cross-sectional configuration for receiving and supporting in said opening a rotary hand tool.

4,122,957

LIFT TRUCK HAVING HEIGHT INDICATING MEANS

Ralph E. Allen, and Christian D. Gibson, both of Greene, N.Y., assignors to The Raymond Corporation, Greene, N.Y.

Filed Oct. 6, 1977, Ser. No. 839,908
Int. Cl.[2] B65G *1/06*; G05D *3/08*
U.S. Cl. 214—16.4 A **19 Claims**



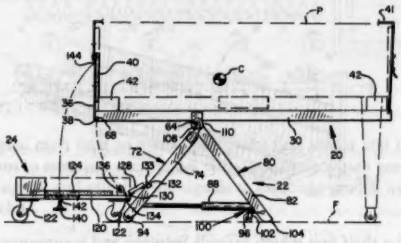
17. Apparatus for indicating the height of a lift truck load carriage relative to any of a plurality of reflective markers located at a plurality of different heights, comprising, in combination: photosensor means carried on said carriage and operative to provide an output signal whenever said carriage has a predetermined vertical relationship to any of said reflective markers; reel means having a cable connected to said carriage and operative to provide a shaft rotation commensurate with lifting and lowering of said carriage; an indicator means carried on said lift truck; a variable electrical device connected to operate said indicator means; clutch means responsive to at least one of said output signals for connecting said shaft rotation to vary said electrical device; means responsive to a predetermined variation of said electrical device for disengaging said clutch means; and means operable upon disengagement of said clutch means for returning said electrical device to a reference condition.

4,122,958

PIANO HAND TRUCK

Orla E. Thayer, P.O. Box 473, Waldport, Oreg. 97394

Filed Jul. 20, 1977, Ser. No. 817,369
Int. Cl.[2] B60P *1/34*
U.S. Cl. 214—38 CC **23 Claims**



1. A hand truck for transporting a freestanding article having an elevated undersurface comprising:

an elongated frame having a foot plate on one end thereof for supporting an article adapted to be placed on said frame;

jacking means attachable to said frame for lifting thereof and for free pivotal movement of said frame with respect to all portions of said jacking means about a horizontal pivot axis; and

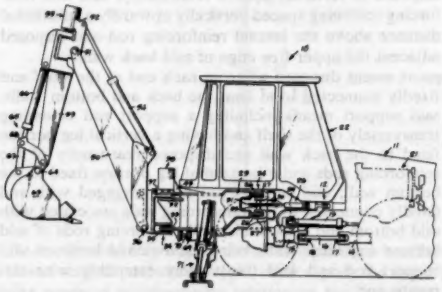
a generally horizontal transport base supported by casters and adapted to receive and cradle said foot plate.

4,122,959

BACKHOE WITH MULTI-MOVEMENT CAPABILITIES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 661,088, Feb. 25, 1976, Pat. No. 4,049,139.
This application May 9, 1977, Ser. No. 795,336
Int. Cl.[2] B62D *5/06*
U.S. Cl. 314—138 R **8 Claims**



1. In an articulated construction vehicle of the type comprising a front frame, a rear frame and connection means pivotally interconnecting said front and rear frames together, the improvement wherein said connection means comprises a single universal pivot means pivotally interconnecting said front and rear frames together directly for relative pivotal and vertical movement and a single link means disposed below and at least in general vertical alignment with respect to said pivot means and universally interconnected by universal connections between said front and rear frames, said universal pivot means disposed longitudinally between the universal connections connecting said link means to said front and rear frames and further and continuously disposed in longitudinal alignment with respect to the universal connection connecting said link

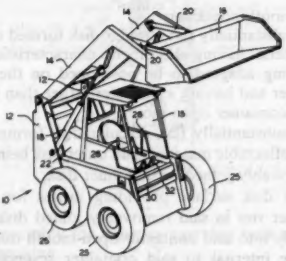
means to said rear frame whereby upon relative articulation of said front and rear frames about said universal pivot means said link means will pivot about the universal connection connecting said link means to said rear frame and said front frame and said link means are permitted vertical movements relative to said rear frame.

4,122,960

PEDAL LINKAGE FOR THE BOOM ARMS AND ATTACHMENT CARRIER OF A SKID-STEERED TRACTOR VEHICLE

James J. Bauer, Lisbon, and Lonnie D. Hoechst, Gwinner, both of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 635,537, Nov. 26, 1975, Pat. No. 4,063,832.
This application Jun. 22, 1977, Ser. No. 808,935
Int. Cl.[2] E02F *3/70*
U.S. Cl. 214—140 **3 Claims**



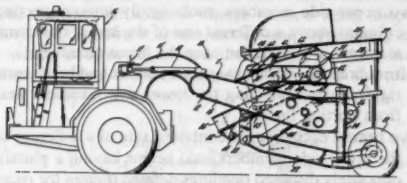
1. In a skid-steered tractor vehicle, a body, an engine mounted toward the rear, an operator's compartment forward of the engine having a space near the front of the body for the operator's legs, a pair of uprights, one on each side of the body, boom arms pivotally connected to the uprights extending forwardly and downwardly at the front of the body in the lowered position, an attachment carrier pivotally mounted on the ends of the boom arms, fluid motor means connected between the uprights and boom arms for raising and lowering the boom arms, other fluid motor means connected between the boom arms and attachment carrier for pivoting the attachment carrier, a control valve for operating the boom arms and attachment carrier having a first valve spool movable from a neutral position in one direction for extending the one fluid motor means causing the boom arms to be raised and movable in the opposite direction from the neutral position for retracting the one fluid motor means causing the boom lift arms to be lowered, a second valve spool operable in the same manner as the first for causing the other fluid motor means to either extend or retract for pivoting the attachment carrier, the improvement comprising rockable foot pedals in the operator's compartment, a first link member connected to one of the pedals, a second link member connected to one of the valve spools, said first and second link members having their opposite ends spaced laterally, a bridging link connecting the opposite ends of the first and second link members having a connection intermediate its ends on the vehicle, said connection including a pin received in a slot, each longer than it is wide in the lateral direction, one having flat sides while the other has curved sides in rockable, antifriction contact therewith, said bridging link rocking on said antifriction contact for transmitting the linear motion of the first link to said second link corresponding to the movement of said pedal, and other link means connecting the other pedal and valve spool to extend or retract the other fluid motor.

4,122,961

POT HANDLLING TRAILER WITH COMPOUND ACTION

Edward S. Kress, Peoria, Ill., assignor to Kress Corporation, Brimfield, Ill.

Filed Oct. 31, 1977, Ser. No. 846,813
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—313 **2 Claims**



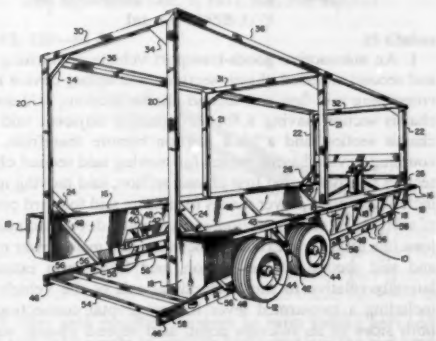
1. A trailer for handling a ladle having trunnions and a projection with top and bottom surfaces spaced from said trunnions, comprising in combination, a wheeled open-ended frame proportioned to embrace said ladle, a cradle pivoted on said frame and being open-ended to embrace said lable, a reaction frame pivoted on said cradle and having portions to engage and contain said trunnions in a position central of said wheeled frame, said frame having pads fitting about said top and bottom projection surfaces when said reaction frame portions contain said trunnions, means for elevating said cradle and reaction frame to a ladle carrying position, a first pair of linear actuators interconnecting said frame and said cradle for swinging the cradle, frame and ladle engaged by said cradle and frame to a ladle dumping position wherein said trunnions, and said ladle, are shifted out of said central position, and a pair of linear actuators interconnecting said cradle and said reaction frame for swinging the frame and ladle fitted in said frame pads to a ladle inverted position.

4,122,962

TRAILER

Wayne M. Goodwin, Sr., 2740 Farmers Branch Lane, Dallas, Tex. 75234

Filed Jul. 5, 1977, Ser. No. 812,819
Int. Cl.[2] B60P *1/14, 1/16*
U.S. Cl. 214—394 **4 Claims**



1. A trailer for hauling a load, comprising:
two lower side members extending beside each other in the direction of said hauling and separated to receive the load in the space between the members;
two wheel assemblies, each connected to a different one of the side members, on the outboard side thereof;
a first pair of vertical columns, each rigidly mounted on a

different one of the side members, near the rear portion thereof;

a second pair of vertical columns rigidly mounted on the side members near the front porton thereof;

first and second brace members associated with the first and second pairs of columns, respectively, rigidly interconnecting the two columns of each pair of points near the tops of the columns and substantially above the lower side members;

two upper side members, each rigidly interconnecting the columns above a different one of the lower side members, at points of connection near the brace members;

a front brace member lower than said second brace member, rigidly interconnecting the lower side members near the front portion thereof;

two beams, each along the inboard side of a different one of the lower side members, said beams having a plurality of oppositely disposed openings defined therein for receiving a plurality of crossbars supported between the beams;

a crossbeam interconnecting the two beams near the front thereof; and

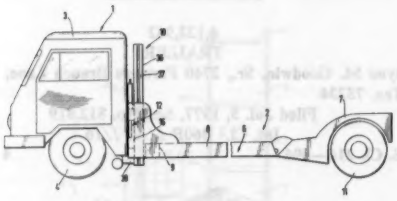
means for selectively lowering the beams to a loading position near the ground and raising the beams to a hauling position.

4,122,963

AUTOMOTIVE GOODS-TRANSPORT VEHICLE

Kjell W. Berglund, Revingevagen 4, 240 35 Harlosa, and Karl S. Nordlund, Bjarshog, 212 90 Malmo, both of Sweden

Filed Feb. 24, 1977, Ser. No. 771,808
Claims priority, application Sweden, Feb. 25, 1976, 7602309
Int. Cl.[2] B60P *1/02*
U.S. Cl. 214—512 **19 Claims**



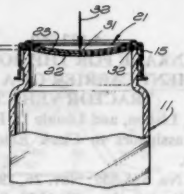
1. An automotive goods-transport vehicle comprising first and second wheeled chassis sections, a coupling device interconnecting said first and second chassis sections, said second chassis section having a forward portion adjacent said first chassis section and a back portion remote therefrom, said coupling device having means for moving said second chassis section relative to said first chassis section, said moving means including a main power means for raising said forward portion of said second chassis section, said coupling device including at least one lifting arm extending between said main power means and said second chassis section, said lifting arm extending laterally relative to the longitudinal axis of the vehicle and including a two-armed lever having pivotal connections on both sides of its fulcrum point, said second chassis section including at least two wheeled chassis arms, said second chassis section including remote power means coupled with said chassis arms, said chassis arms being swingable by said remote power means for raising said back portion of said second chassis section, said main power means cooperating with said remote power means such that said remote power means are operated as slave units to said main power means so as to coordinate the movements of all of said power means.

4,122,964

REUSABLE CLOSURES FOR HERMETICALLY SEALING CONTAINERS

Neal R. Morris, 5990 Hunter, Ventura, Calif. 93003

Continuation of Ser. No. 702,249, Jul. 2, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,010
Int. Cl.[2] B65D *41/02*
U.S. Cl. 215—260 **24 Claims**



23. A system for hermetically sealing containers, comprising:

an open-mouth container;

an inner substantially flat circular disk formed of a non-porous material having elastomeric characteristics, said inner disk being adapted to be positioned on the rim of said container and having a diameter larger than the diameter of said container open-mouth;

an outer substantially flat, circular disk formed of a semi-rigid, deflectable material, said outer disk being adapted to be removably joined to said inner disk;

said inner disk surface providing means for wiping said container rim as said removably joined disks are drawn inwardly into said container open-mouth due to reduced pressure internal to said container respective pressure external to said container; and,

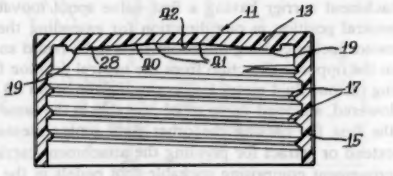
said disk inner surface providing means for hermetically sealing said container as said removably joined disks are drawn inwardly into said container.

4,122,965

LINERLESS CLOSURE

Gerald L. Roy, Lancaster, Pa., assignor to Kerr Glass Manufacturing Corporation, Lancaster, Pa.

Filed Jul. 7, 1977, Ser. No. 813,622
Int. Cl.[2] B65D *53/00*
U.S. Cl. 215—344 **6 Claims**



1. A linerless closure for sealing a glass finish on a glass container having an external screw thread for threadably receiving said closure, said closure comprising a one-piece body of polypropylene having a top end wall for extending across the open top of a container, a dependent skirt wall integrally joined to said top end wall about the outer circumference of said top end wall, an integral screw thread formed on the inner side of said skirt wall for threading engagement with the external screw thread on a glass container, a rigid base ring means integral with and depending from said top wall, said base ring means having a substantially tapered cross section increasing in thickness in a radially outward direction, a rigid annular sealing fin having a downwardly tapered cross section integrally connected with and depending from said base ring means, a

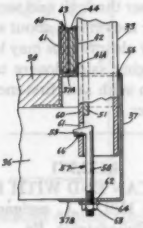
lower sealing end on said sealing fin for being crushed against the container finish to spread and to conform to irregularities in the container finish, said lower sealing end being substantially rigid and non-bending and being permanently deformed to a wider width when crushed, said base ring means having a substantially wider width than the upper end of said sealing fin and providing a substantially non-deformable support for said sealing fin, said sealing fin being crushed when used and non-returnable to its original shape after removal of said closure from a container, said crushed sealing fin being the only sealing member on said closure.

4,122,966

SANDWICH PANEL BOX STRUCTURE

Michael O. Anderson, Forest City, Iowa, assignor to Winnebago Industries, Inc., Forest City, Iowa

Filed Apr. 30, 1975, Ser. No. 573,319
Int. Cl.[2] B62D *23/00, 25/00, 27/06*
U.S. Cl. 220—1.5 **5 Claims**



1. A box assembly for vehicles carrying bulk material and the like, comprising,

a peripheral frame including a substantially planar top wall portion and a bottom wall portion spaced therefrom,

a floor mounted on said frame therewithin,

a plurality of substantially vertical front, side, and rear end walls seated upon and extending upwardly from said frame top wall portion, thereby to define with said floor a box,

a plurality of upright stakes,

first fastening means securing said walls to said stakes,

said frame top wall portion having holes therein at intervals therealong for receiving the lower ends of said stakes therethrough and with said stake lower ends in spaced relation to said frame bottom wall portion thereby to seat said walls secured thereto on said frame top wall portion, and,

second fastening means extending between said frame bottom wall portion and each said stake lower end securing said stakes to said frame with said walls urged firmly against said frame top wall portion.

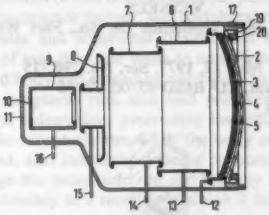
4,122,967

VACUUM-TIGHT WINDOW STRUCTURE FOR THE PASSAGE OF X-RAYS AND SIMILAR PENETRATING RADIATION

Heinz Röhrich, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 3, 1977, Ser. No. 756,472
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1976, 2605376
Int. Cl.[2] H01J *35/18*
U.S. Cl. 220—2.3 R **10 Claims**

1. A vacuum-tight window structure for the passage of X-ray energy and similar penetrating radiation, said structure comprising a frame having a tubular frame section with an edge directed generally axially toward the exterior side of the window construction, the tubular frame section extending generally axially and having a radially inner annular surface directed radially inwardly, a window member having a central disc-shaped window section transparent to penetrating radiation and having a tubular window flange section extending generally axially and providing radially inner and radially outer annular surfaces directed radially inwardly and radially outwardly respectively, and a ring section, said sections being assembled in a press-fit relationship to form a vacuum-tight joint between the frame section and the tubular window flange section with the material of the outer section having a thermal coefficient of expansion smaller than that of the window flange section, the tubular window flange section being disposed interiorly of the tubular frame section and terminating in an edge which is directed toward the exterior of the window structure, the ring section being disposed within the tubular



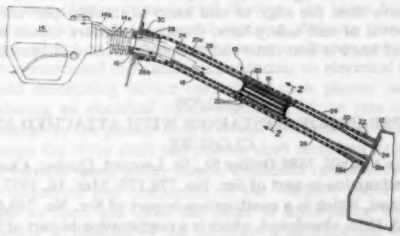
window flange section, and the window flange section being of material having a thermal coefficient of expansion greater than that of the tubular frame section, the radially outer annular surface of the tubular window flange section mating with the radially inner annular surface of the tubular frame section, the ring section having an axially extending radially outer annular surface mating with the radially inner annular surface of the tubular window flange section, the ring section being encircled by both the tubular window flange section and the tubular frame section, and the tubular frame section, the tubular window flange section and the ring section being forced together with sufficient pressure therebetween at the mating surfaces thereof to provide a vacuum-tight mechanical press-fit relationship in the absence of any additional securing means.

4,122,968

VAPOR RECOVERY FILLER NECK ASSEMBLY

Lee A. Germain, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 740,504, Nov. 10, 1976, abandoned.
This application Dec. 9, 1977, Ser. No. 858,922
Int. Cl.[2] B65B *3/18*
U.S. Cl. 220—86 R **15 Claims**



1. A filler neck mounted between an entry fueling port and a fuel tank inlet nipple to provide fuel entry into the tank and recovery of fuel vapor from the tank while being serviced from a fuel dispensing nozzle having vapor recovery means, said filler neck comprising:

(A) a fuel delivery tube having a plurality of substantially longitudinal ribs extending the full length of its outside surface, said tube having one of its ends connected into the tank inlet nipple such that the ribs engage the inside of the nipple while the opposite end is left unconnected but the

length of the tube toward the fueling port is sufficient for receiving the dispensing nozzle therein: and

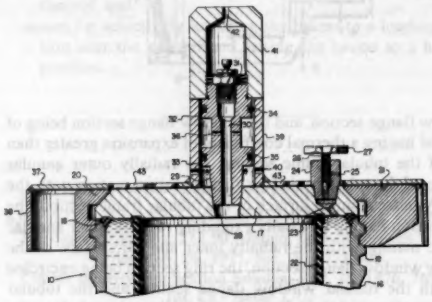
(B) a sleeve tube mounted over and coaxial with the fuel delivery tube and having one of its ends connected over the outside of the tank inlet nipple while the opposite end is connected to the fueling port, the relationship of the two tubes being such that a vapor path exists between the tubes in the valleys defined by the ribs and upon receiving an impact force at the fueling port connection the sleeve tube may move telescopically relative to the fuel delivery tube.

4,122,969

SAFETY CLOSURE APPARATUS FOR PRESSURE VESSELS

Dale G. Hugley, 3815 Timberline Dr. So., Fort Worth, Tex. 76119

Filed May 12, 1977, Ser. No. 796,215
Int. Cl.[2] B65D *45/00, 51/18*
U.S. Cl. 220—256 **8 Claims**



5. Safety closure apparatus for a pressure vessel having closure means with actuating surfaces thereon, said apparatus comprising:

a safety hood mounted on said closure means, said hood being generally conformed in shape to said closure means and having portions positioned to cover and block access to the actuating surfaces of said closure means and to give access to said actuating surfaces upon outward movement of said hood away from said closure means;

a vent valve for said vessel mounted on said closure means;

actuating means for said vent valve;

said safety hood being slotted to fit over said vent valve, said actuating means for said vent valve comprising a knob extending over a portion of said hood outwardly thereof; said slot having an edge lying radially closer to said vent valve than the edge of said knob to thereby prevent removal of said safety hood from said closure means until said knob is first removed to thereby vent said vessel.

4,122,970

TAMPER-PROOF CONTAINER WITH ATTACHED END CLOSURE

Arnaldo Amabili, 7680 Dollier St., St. Leonard, Quebec, Canada

Continuation-in-part of Ser. No. 778,175, Mar. 16, 1977, abandoned, which is a continuation-in-part of Ser. No. 749,622, Dec. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 738,078, Nov. 2, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 861,664
Int. Cl.[2] B65D *51/18*
U.S. Cl. 220—256 **23 Claims**

1. A container closure device comprising a closure member having a pair of opposed wall sections one of which is adapted to constitute an exterior wall section for said closure member and the other of which is adapted to constitute an interior wall section for the closure member, said closure member having a first aperture therein adapted to permit dispensing of a commodity from a container on which the closure member may be mounted, a second aperture in said closure member located in a spaced-apart operative relationship to said first-mentioned aperture, an outer closure tab adapted to surround and close said first-mentioned aperture on the exterior surface of said closure member,

an inner closure tab adapted to be located in juxtaposition with the interior wall of said closure member, said inner closure tab having a body portion adapted to surround in

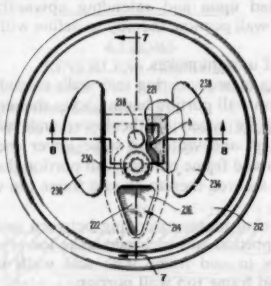
closing relationship said first-mentioned aperture of said closure member, means for mounting said outer closure tab and said inner closure tab in spaced-apart fixed relationship to each other through said second aperture of said closure member for movement about a fixed axis, whereby said outer and inner closure tabs may be rotated about said fixed axis for bringing said closure tabs into and out of closing relationship with said first-mentioned aperture of said closure member.

4,122,971

EASY OPENING CAN END WITH PUSH-IN TABS

Vinson S. Potts, Cherry Hill, N.J., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Continuation of Ser. No. 701,623, Jul. 1, 1976, which is a continuation-in-part of Ser. No. 637,867, Dec. 4, 1975, abandoned, and Ser. No. 596,530, Jul. 16, 1975, abandoned. This application Dec. 23, 1977, Ser. No. 863,892
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—268 **19 Claims**



1. A can end of the easy opening type comprising:

an end panel having an exterior side and an interior side, said end panel including a preformed dispensing opening and a peninsular hinge portion integrally formed with said end panel and extending into said dispensing opening;

a tab juxtaposed to said opening and said peninsular hinge portion, said tab including a first portion adapted to be permanently attached to said end panel adjacent said hinge portion and a second portion adapted to be releasably attached to said end panel around the periphery of said opening;

sealing means for attaching said first portion and said second portion to said end panel; and

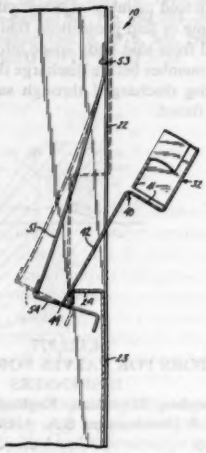
said tab including means of attachment to said hinge portion on said exterior side and said interior side of said end panel so as to assure attachment of said tab to said end panel after opening.

4,122,972

WEATHERPROOF CABINET CLOSURE

Robert Bozich, Eveleth, Minn., assignor to Malton Electric Company, Virginia, Minn.

Filed Jan. 25, 1978, Ser. No. 872,106
Int. Cl.[2] B65D *73/02, 85/42*
U.S. Cl. 220—331 4 Claims



1. In a weather resistant cabinet comprising a cabinet structure and a cover, said structure including a bottom, a pair of opposite sides, a back, an open top, and a front having an open upper portion and a lower portion closed by a panel having an inturned upper lip, and said cover having a top portion, configured to resiliently engage the upper edges of said back and said sides outwardly, and a front portion, configured to resiliently engage the edges of said sides outwardly, the improvement which comprises:

(A) a pair of flanges flanking the front edges of said sides and extended toward one another,

(B) resilient means secured to the rear surfaces of said flanges and extending therefrom downwardly and toward each other,

(C) forwardly directed support means carried at the bottom of said resilient means and normally urged below the lip of said panel and toward the inner surface of said panel, and

(D) a tongue extending from the bottom of said front portion of said cover and stepped inwardly and then downwardly to fit over and behind said lip and between said flanges.

4,122,973

LINED CONTAINERS FOR PAINT AND THE LIKE

Paul B. Ahern, 32 Stevens Rd., Melrose, Mass. 02176

Filed Oct. 14, 1977, Ser. No. 842,274
Int. Cl.[2] B65D *25/16*
U.S. Cl. 220—404 2 Claims

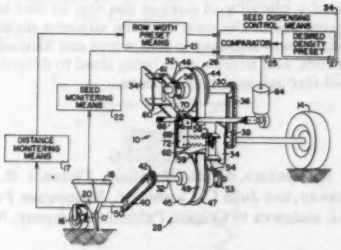
1. A disposable liquid-proof liner nestable closely within a rigid open-topped receptacle of predetermined shape and dimensions having a closed bottom and upstanding side walls terminating in an open upper rim, comprising a one-piece open-topped hollow, thermoplastic body having a closed circular bottom and a thin upstanding tubular side wall of external configuration and dimensions substantially matching those of the interior of a receptacle which it is to line, said thin side wall being capable of flexing into a desirable clinging skin-tight relationship with the interior of said receptable, said thin side wall having stiffness rendering it self-sustaining against tendencies to collapse, said stiffness promoted by several peripherally-spaced venting and stiffening ribs extending substantially vertically and being indented inwardly from said side wall toward the liner interior to form open channels running fully from the bottom of said body to an upper peripheral rim of said body on the exterior thereof, said peripheral rim being substantially annular and somewhat flexible and several times the thickness of said thin side walls to contribute peripheral stiffness to said body and extending outwardly to overlie the upper enlarged receptacle rim, and said peripheral rim having a plurality of indentations protruding inwardly just below the level of the receptacle rim when the body and receptacle are fully mated, said indentations being proportioned to frictionally engage the receptacle rim and thereby hold the body in fixed relationship to a receptacle which it lines.

4,122,974

VARIABLE SPEED PLANTER SEED DRIVE

Jimmy D. Harbert, Coal Valley, and Harold V. Hansen, Cordova, both of Ill., assignors to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 677,811, Apr. 16, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,367
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—13 14 Claims



1. In a planter having a main frame and at least two seed dispensing planter units carried thereon, the latter having a planter drive shaft; a ground-engaging distance measuring wheel carried on the frame and having a distance monitoring device associated therewith for producing an electrical signal; a seed monitoring device carried on each planter unit for producing an electrical signal indicative of the rate of seed discharge by the planter unit; a driven drive shaft; a belt drive between the drive shaft and planter shaft including an adjustable variable speed pulley means; a member rotatable in opposite directions and connected to the variable speed pulley means to open and close the latter in accordance with the direction of rotation of the member; a bidirectional electric motor drivingly connected to the rotatable member; a row width preset means for receiving signals from the distance monitoring device and for producing an electrical signal; and a seed dispensing control means for setting the desired seed density for said planter units, said control means including a comparator means for receiving signals from the seed monitoring device and the row width preset means and responsive to said signals to determine seed discharge density and to compare said discharge density to desired seed density to thereby pass an electrical signal to and for driving said electric motor

in the direction necessary to make the monitored seed density substantially equal to the desired seed density.

4,122,975

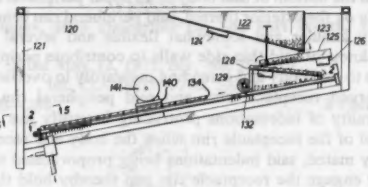
NAIL SEPARATOR APPARATUS

James V. Lowery, 1020 Dorothy St., Houston, Tex. 77008; Charles L. Lowery, 212 Taylor #2, Anchorage, Ak. 99504; Vernon L. Lowery, 6621 Stroud, Houston, Tex. 77074, and Jimmy R. Lowery, 1040 RUtland, Houston, Tex. 77008

Division of Ser. No. 276,131, Jul. 28, 1972, Pat. No. 4,025,030. This application May 23, 1977, Ser. No. 799,377

Int. Cl.[2] B65H *9/00*

U.S. Cl. 221—173 **16 Claims**



1. A nail separator comprising:

(a) container of nails adapted to supply a plurality of nails arranged in a random manner with respect to one another;

(b) at least a pair of parallel and spaced rods in proximity of said source and arranged to receive thereon a plurality of nails, said rods being spaced apart by a distance greater than the diameter of the shaft of the nails but less than the width of the heads thereon to define a slot;

(c) a worm arranged around at least one of said rods and having a pitch sized to receive the shaft of one of the nails between adjacent turns on said worm;

(d) means for relatively advancing said worm relatively toward a plurality of nails in the slot so that said worm engages one of the nails between adjacent turns; and

(e) notch means adjacent to said worm and formed in one of said rods, said notch means being sized to drop the head of a nail through said notch means.

4,122,976

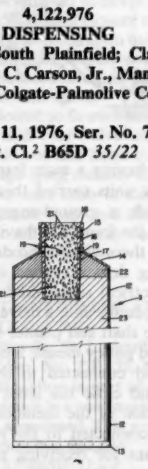
DISPENSING

Divaker B. Kenkare, South Plainfield; Clarence R. Robbins, Piscataway, and John C. Carson, Jr., Mansaquan Park, Ala.L OF NJ, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 11, 1976, Ser. No. 741,097

Int. Cl.[2] B65D *35/22*

U.S. Cl. 222—94 **5 Claims**



1. A container for dispensing creams, gels, pastes and the like in a solid column wherein fluent material of a predominantly base color has at least on its outer surface random but distinctive streaks and/or areas presenting a marbleized appearance comprising a flexible walled body adapted to contain a supply of said base color material, said body having a discharge outlet at one end, an open-ended tubular member fixed in said body with its outer end in said outlet and extending within the body sufficiently to dispose its inner end within the supply of base color material, means distributed over the internal surface of said member providing a multiplicity of irregular fixed sharp randomly spaced internal surface projections, means defining a space within said body around said member for a supply of fluent different color material, and means providing a plurality of openings in said member adjacent said outlet and upstream of at least some of said projections that are disposed to introduce material from said body space into base material passing through said member before discharge through said outlet, said materials being discharged through said member when the body wall is flexed.

4,122,977

ACTUATORS FOR VALVES FOR PRESSURIZED DISPENSERS

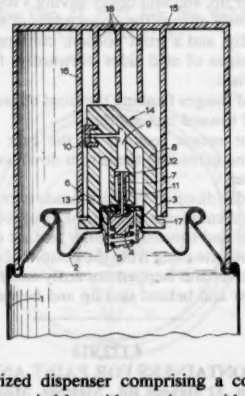
Roger A. Butcher, Horndean, England, assignor to Aerosol Inventions & Development S.A. AIDSA, Fribourg, Switzerland

Filed Feb. 3, 1977, Ser. No. 765,393

Claims priority, application United Kingdom, Feb. 13, 1976, 5672/76

Int. Cl.[2] B65D *83/14*

U.S. Cl. 222—182 **2 Claims**



1. A pressurized dispenser comprising a container and a valve assembly carried by said container, said assembly comprising a valve member, a stem and an actuating button, said stem connecting said valve member to said button, a valve seating, a valve mounting receiving said seating, said valve member being normally sealed against said seating but, on tilting of said valve member by said button, allowing dispensing of a product through said stem and button, wherein said button is movable with respect to said valve member in a direction along the axis of said stem between a first position wherein said button is free to tilt, and a second position wherein co-operating surfaces on said button and said valve mounting prevent tilting of said button, said container further comprising a removable overcap, said overcap being adapted to fit onto said container to conceal said valve assembly, and co-operating surfaces on said overcap and said button whereby application of said overcap to said container causes, through said last-mentioned surfaces, displacement of said button from said first to said second position.

4,122,978

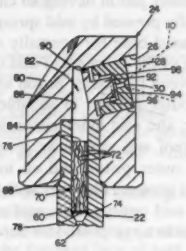
PRESSURIZED PACKAGE FOR DISPENSING A PRODUCT IN A FINELY DISPERSED SPRAY PATTERN WITH LITTLE DILUTION BY PROPELLANT

Ronald N. Guimond, Stoughton, and Harold R. Thompson, Duxbury, both of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 587,834, Jun. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,701, Jul. 29, 1974, abandoned. This application Oct. 6, 1976, Ser. No. 729,997

Int. Cl.[2] B65D *83/14*; B67D *5/58*

U.S. Cl. 222—189 **26 Claims**



1. A dispensing package for dispensing a liquid product such as a deodorant or a hair spray with less than ten percent propellant dilution in a finely divided and reproducible spray pattern that has substantially the same characteristics as the spray pattern of the liquid product dispensed in an aerosol system with about sixty percent propellant dilution comprising a pressurized container having therein a liquid product to be dispensed and a gaseous propellant, a valve for controlling the flow of product from the container, a discharge passage extending from said valve to a discharge orifice, said discharge orifice having a diameter in the range of 0.1–0.4 millimeter, a flow control member disposed in said discharge passage between said valve and said discharge orifice, said flow control member having multiple elongated passages and over dispensed through the discharge orifice, said product being dispensed from discrete passage apertures, the flow dimension of each elongated passage being in the range of one to one hundred microns, the total effective flow area of said elongated passages being greater than the area of said discharge orifice, and the length of at least some of said elongated passages being substantially greater than the maximum dimension of said discharge passage transverse to the product flow direction, said flow control member in dispensing action producing a pressure drop between its upstream and downstream ends as the product flows through said elongated passages, and product breakup means in said discharge passage between said flow control member and said discharge orifice for producing a turbulent flow pattern that assists the breakup of the liquid product into desirable spray form as it is dispensed through the discharge orifice, said product being dispensed from said discharge orifice in a finely divided spray pattern with less than 10 percent dilution by the gaseous propellant.

4,122,979

SQUEEZE BOTTLE CONTAINING A LIQUID PRODUCT AND OPERATIVE WHETHER UPRIGHT CR INVERTED

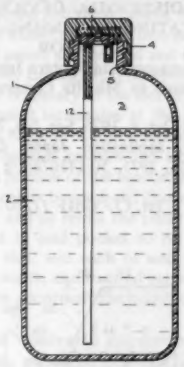
Robert H. Laauwe, 237 Green Ridge Rd., Franklin Lakes, N.J. 07417

Continuation-in-part of Ser. No. 691,709, Jun. 1, 1976. This application Apr. 20, 1977, Ser. No. 789,189

Int. Cl.[2] B65D *83/06*

U.S. Cl. 222—193 **9 Claims**

1. A liquid dispensing package comprising a container containing the liquid and a gas or vapor above the liquid, said container being provided with a dispensing nozzle having a spray orifice opening from a swirl chamber having at least two tangential injection orifices, a first means for connecting one of said injection orifices with said liquid, a second means for connecting the other of said injection orifices with said space, and means for pressurizing said gas or vapor and said liquid, said swirl chamber forming a substantially flat circular space,



said spray orifice opening axially and substantially centrally from said space and said injection orifices opening transversely into the periphery of said space and pointing in the same directions substantially tangentially with respect to said periphery, said space being an enclosed space other than for said orifice.

4,122,980

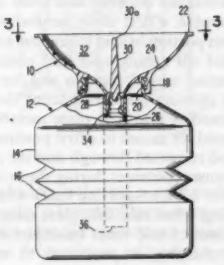
CONTAINER TOP WITH INTEGRAL STOPPER

Gerald C. Laverty, Santa Clara, Calif., assignor to Gary J. Mastman, San Jose, Calif.

Filed Jul. 25, 1977, Ser. No. 819,033

Int. Cl.[2] B65D *41/34*

U.S. Cl. 222—207 **2 Claims**



1. A top for a container having a corrugated side wall and an open neck comprising: a funnel-shaped body of a moldable material, said body having a top opening, a passage therethrough centrally disposed at the bottom thereof, and means thereon for coupling the body to the neck of the container with the passage communicating with the container, the body having an inner surface provided with a downward slope extending throughout a major part of the distance between said top opening and the passage and terminating at the passage; and an elongated stopper having a tapered outer surface and being of said material, said stopper being integral at one end thereof with the body at the termination of said inner surface, in alignment with said passage, and extending upwardly therefrom with the upper end of the stopper being adjacent to and below said top opening, there being a line of weakness at the junction between the body and the stopper to permit the latter to be separated from the body when the stopper is shifted relative to the body, the stopper having a maximum transverse dimension greater than that of the passage, whereby the stopper, after

being separated from the body, can be inverted and inserted into the passage to at least partially close the same.

4,122,981
TONER DISPENSING DEVICE HAVING RECIPROCATING DISPENSING PLATE AND AGITATOR

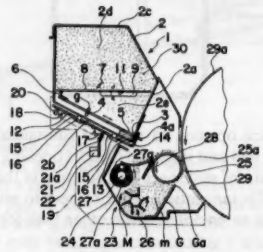
Koji Takeuchi, Gamagori, and Syotaro Inagaki, Okazaki, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1976, Ser. No. 729,602

Claims priority, application Japan, Oct. 18, 1975, 50-142296[U]; Oct. 25, 1975, 50-145674[U]; Aug. 20, 1976, 51-112158[U]

Int. Cl.² G01F *11/10*

U.S. Cl. 222—231 **7 Claims**



1. A toner dispensing device for use in an electrophotographic copying machine having a dry process developing apparatus, said toner dispensing device comprising a toner container disposed adjacent the developing apparatus for accommodating therein toner for replenishing toner used by the developing apparatus and having a bottom portion extending toward said developing apparatus, slit means in said bottom portion of said container between said toner container and said developing apparatus, a first plate member movably disposed along said bottom portion of said toner container for reciprocation through said slit means, said first plate member having bridging preventing means thereon and having at least one toner supplying opening therein adjacent the end thereof and which is positioned in said first plate member for being projected through said slit means to a first position in said developing apparatus and retracted through said slit means to a second position in said toner container during the reciprocation of said first plate member for transporting toner which fills said toner supplying opening when said first plate member is within said toner container out of said toner container as said opening in said first plate member is projected to said first position through said slit means, and a second plate member for stabilizing the toner and having a plurality of openings therein and being movably mounted in said toner container above said first plate member for dividing the interior of said toner container into upper and lower portions each containing toner therein, said second plate member being movable in association with the reciprocation of said first plate member for causing toner to pass through said openings in said second plate member into said lower portion of said toner container.

4,122,982
AEROSOL METERING VALVE PROVIDED WITH PUMPING EFFECT

Giancarlo Giuffredi, Milan, Italy, assignor to Coster Tecnologie Speciali S.p.A., Italy

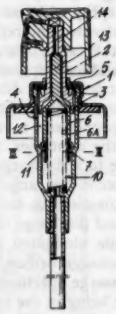
Filed Mar. 8, 1977, Ser. No. 775,626

Claims priority, application Italy, Mar. 16, 1976, 20983/76[U]

Int. Cl.² B67D *5/42*

U.S. Cl. 222—321 **8 Claims**

1. In an aerosol valve assembly, a hollow cylinder adapted to be fixed to an upper portion of a container the contents of which are to be dispensed, said cylinder having an inner open end adapted to communicate permanently with the interior of the container, an outer piston slidable fluid-tightly in said cylinder and having an elongated piston rod portion extending fluid-tightly through and beyond an outer end of said cylinder, said piston rod portion being formed with an axial bore passing therethrough and forming part of a dispensing path of travel for the contents of the container while said contents travel through said axial bore from an inner end toward an outer end thereof, an inner piston situated in said cylinder between said outer piston and said inner end of said cylinder, and spring means in said cylinder urging said inner piston toward said outer piston, said inner piston having an elongated solid piston rod portion normally pressed by said spring means against said inner end of said axial bore for normally closing the latter to prevent dispensing of the contents of said container, said inner piston having between said outer piston and said inner end of said cylinder an outer portion in slidable fluid-tight contact with said cylinder, and said inner piston having between said outer portion thereof and said outer piston an outer surface spaced from said outer piston and an inner surface of said cylinder to define a pressure chamber with said inner surface of said cylinder and said outer piston, said spring means urging both of said pistons to a rest position where said outer piston is

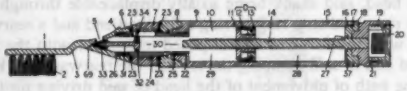


distant from said inner end of said cylinder while said inner piston is maintained by said spring means in a closed position closing said axial bore, said inner piston having a passage means placing an interior portion of said cylinder at the region of said inner end thereof, and thus the interior of said container, in communication with said pressure chamber when said pistons are in said rest position thereof but preventing communication between said interior portion of said cylinder and said pressure chamber when said pistons are both manually displaced toward said inner end of said cylinder in opposition to said spring means during a pressure stroke applied to said outer piston and through the latter to said inner piston for dispensing the contents of the container through said axial bore, said inner piston having in said pressure chamber in a plane normal to the axis of said bore a cross-sectional area at the outer surface of said inner piston great enough to provide from the incresing pressure of the fluid in said pressure chamber during the pressure stroke of said pistons a force sufficient to advance said inner piston automatically in opposition to said spring means inwardly beyond said outer piston for opening said axial bore to provide for automatic dispensing of the contents of the container when the pressure in said pressure chamber has increased sufficiently, whereby the contents of the container will be dispensed at a pressure greater than that prevailing in the interior of the container.

4,122,983
VERSATILE DISPENSING DENTAL HYGIENE AND SHAVING DEVICE

James D. Jolly, Rte. 2, Glen Dean, Ky. 40141

Filed Oct. 4, 1976, Ser. No. 729,116
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—390 8 Claims

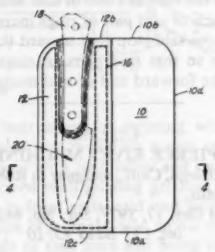


1. A portable dispensing device comprising
a head assembly having an orifice therein;
a handle assembly removably attached to said head assembly, said handle assembly comprising
a hollow substantially rigid reservoir housing;
a piston assembly axially mounted within said reservoir housing;
a plug means at the end of said housing opposite said head assembly for sealing said housing;
an aperture through said housing positioned so that it is always behind the forward face of said piston;
a tapered expandable sleeve;
a compensating expander within said sleeve;
mating means within said sleeve and on the exterior of said expander for preventing rotational movement between said sleeve and said expander;
a piston compressing adjusting disk for axially moving said expander within said sleeve;
internal threading within said expander;
an externally threaded feed rod extending substantially the length of said housing and mating with said internal threading of said expander; and
an actuating knob secured to said feed rod externally of said housing.

4,122,984
POCKET SCABBARD FOR KNIFE

A. G. Russell, 1705 Highway 71 N., Springdale, Ark. 72764

Filed Jan. 21, 1977, Ser. No. 761,466
Int. Cl.[2] F41B *13/04*
U.S. Cl. 224—2 D 1 Claim

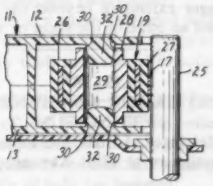


1. A pocket scabbard for a knife comprising:
a first pocket-sized flexible panel of rectangular configuration, having two opposed, substantially parallel side edges, a top edge and a bottom edge and further having a knife-receiving slot opening at said top edge;
second and third panels of rectangular configuration secured to said first panel on opposite sides thereof and each having a side edge aligned in coincidence with one side edge of said first panel and each having a second edge aligned in coincidence with said bottom edge of said first panel, said second and third panels covering said slot except for the opening thereof, each of said second and third panels defining a cavity aligned with said slot, said cavities and slot together forming a handle-receiving pocket for snugly receiving and frictionally engaging the handle of a knife placed in said scabbard and for limiting, by the bottom of said handle-receiving pocket as formed by the convergence of said second and third panels, the distance which the blade of said knife can extend into said knife-receiving slot in said first panel, said second and third panels being sewn to each other through said first panel along sew lines spaced from the boundary of the slot in said first panel so that said first panel terminates at the slot at a location between a knife blade in said slot and said sew lines, said pocket formed by said cavities and slot having a depth sized to cause a portion of the handle of a knife placed in said pocket to project beyond said first-mentioned edge of said first panel, and to retain the point of a blade of the knife positioned in said pocket to be spaced from the bottom of said slot, and each of said second and third panels having a width, as measured between the side edges thereof, which is about half the width of said first panel; and
the cross-sectional transverse dimension of said handle-receiving pocket, measured between said second panel and said third panel, being at least twice the cross-sectional transverse dimension of said knife-receiving slot.

4,122,985
TAPE CARTRIDGE WITH SELF-ALIGNING TAPE TRANSPORT ROLLER

Norman E. Nelson, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 708,377, Jul. 26, 1976, abandoned. This application Nov. 25, 1977, Ser. No. 854,601
Int. Cl.[2] B65H *17/20*
U.S. Cl. 226—181 3 Claims



1. In a tape cartridge including a case including opposed spaced apart sidewalls, a length of tape, support means in said case supporting said tape for movement along a path within said case past a tape drive station, said cartridge being adapted to be received in a recording and/or reproducing machine which machine includes a tape drive capstan positioned to engage one side of the tape at said tape drive station, said support means including a roller having a cylindrical peripheral surface and means for mounting said roller between said sidewalls at said drive station with said peripheral surface supporting the side of said tape opposite the side engaged by said drive capstan when the cartridge is inserted in a said machine, the improvement wherein: said means for mounting said roller comprises interacting portions of said sidewalls and roller providing bearing surfaces in continuous engagement at two locations spaced axially along said roller when said roller supports the tape against a said drive capstan, said bearing surfaces at each of said locations comprising one frusto-conical bearing surface and one circular edge bearing surface, said circular edge bearing surface having a diameter causing it to make engagement at only one position around its periphery when pressed against said frusto-conical surface, said frusto-conical surface being oriented to cause a force biasing said roller axially toward the other of said locations in response to a force applied radially of said roller to bias said bearing surfaces together, and said means for mounting allows movement

of said roller in either axial direction from a normal position with the axis of said roller generally normal to said sidewalls to change both of said spaced locations axially of said frusto-conical surfaces in response to differential forces applied across the width of tape on one side of the peripheral surface by the capstan in a said machine in which the cartridge is positioned, thereby causing tilting of the axis of the roller into parallel alignment with the axis of the drive capstan.

4,122,986

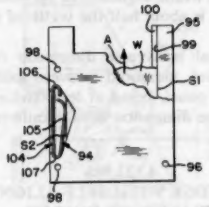
PINNING MACHINE

Richard W. Lewis, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 744,668, Nov. 24, 1976, Pat. No. 4,079,878. This application Jun. 3, 1977, Ser. No. 803,013

Int. Cl.[2] B65H *23/32*

U.S. Cl. 226—198 **3 Claims**



2. Apparatus for guiding the edge of a sheet or web, comprising: means providing an undercut recess, and a leaf spring resiliently held captive in the recess without the aid of fasteners, the spring having a pair of U-shaped portions, an elongated portion joined to one of the legs of the U-shaped portions and a spring finger joined to the other leg of one of the U-shaped portions, the finger extending beyond the recess and being adapted to contact an edge of the sheet or web.

4,122,987

DAMPING DEVICE FOR A FASTENING ELEMENT SETTING GUN

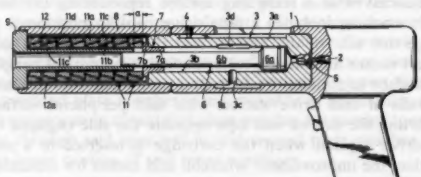
Peter Jochum, Meiningen, Austria, and Eugen Schilter, Zurich, Switzerland, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jul. 12, 1977, Ser. No. 814,930

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1976, 2632413

Int. Cl.[2] B25C *1/14*

U.S. Cl. 227—10 **7 Claims**



1. A setting gun using explosive force for propelling fastening elements into a receiving material comprising an axially elongated barrel forming an axially elongated bore, said bore having a forward end and a rearward end, an axially elongated muzzle tube aligned with and located forwardly of the forward end of said bore, a driving piston axially displaceably mounted within the bore in said barrel and extending forwardly of said barrel into said muzzle tube and being axially displaceable therethrough, an elastic damping device extending in the elongated axial direction of said barrel and located radially outwardly of said muzzle tube and extending in the axial direction between said muzzle tube and said barrel, said damping device having a forward end in contact with said muzzle tube and a rearward end, a stop ring located at and in contact with the forward end of said barrel and extending into contact with the rearward end of said damping device, said stop ring extending into the bore in said barrel, said driving piston comprising a head and an axially elongated shank extending forwardly of said head, said shank being axially displaceable through said stop ring, said stop ring having a forward end and a rearward end with the forward end disposed in contact with the rearward end of said damping device and the rearward end being in the path of movement of the head of said driving piston so that said stop ring is pressed forwardly against said damping device by a gas cushion within the bore as the head on said driving piston moves forwardly through the bore in said barrel, wherein the improvement comprises that said damping device comprises a plurality of pairs of rings arranged in series in the axial direction of said muzzle tube, each said pair of rings comprising an outer ring and an inner ring positioned radially inwardly of said outer ring, each said outer ring having a radially inwardly facing surface, each said inner ring having a radially outwardly facing surface, in each said pair of rings the radially inwardly facing surface on said outer ring being disposed in contact with the radially outwardly facing surface on said inner ring, each said outer and inner ring having a forward end face and a rearward end face each of which extends transversely of the axial direction of said muzzle tube, said damping device being displaceable when the setting gun is fired from an uncompressed condition to a compressed condition where said driving piston is displaced forwardly through the bore in said barrel and said muzzle tube, in the uncompressed condition of said damping device each said pair of rings having the forward end face of said outer ring extending axially forwardly of the forward end face of said inner ring and disposed in contact with the rearward end face of said inner ring in the next forwardly positioned said pair of rings and spaced axially rearwardly from the rearward end face of said outer ring in the next forwardly positioned said pair of rings, said radially inwardly facing surface on said outer ring and said radially outwardly facing surface on said inner ring of each said pair of rings extends in the same direction, said radially inwardly facing surface of said outer ring and said radially outwardly facing surface of said inner ring in each said pair of rings are frusto-conically shaped and converge inwardly in the axial direction toward the forward end of said muzzle tube, and the axial length of each of said pair of rings increases in the direction extending from said stop ring toward the forward end of said muzzle tube so that said pairs of rings have increasing masses toward the forward end of said muzzle tube.

4,122,988

PIERCE RIVET MACHINE

Max Casutt, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Oct. 17, 1977, Ser. No. 842,738

Int. Cl.[2] B21J *15/10*

U.S. Cl. 227—53 **13 Claims**

1. A pierce rivet machine for simultaneously pierce riveting sheets of material to the opposing flanges of a channel shaped member comprising:

a first pierce rivet driver and a second pierce rivet driver, said first and second pierce rivet drivers being diametrically opposed to each other,

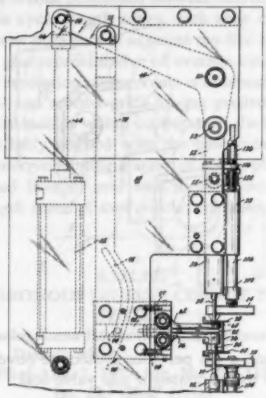
a first pierce rivet holder and a second pierce rivet holder for respectively holding rivets for said first and second pierce rivet drivers,

a first and second anvil each respectively positioned to function in conjunction with the operation of said first and second pierce rivet drivers,

first anvil support means and second anvil support means,

a first drive rod supporting said first pierce rivet driver,

a second drive rod supporting said second pierce rivet driver,



means for driving said first drive rod along an axial reciprocating path and means for driving said second drive rod along an axial reciprocating path.

4,122,989

INSTRUMENT FOR SUTURING WITH METAL STAPLES

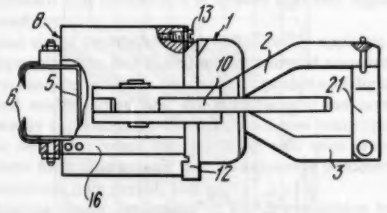
Nikolai N. Kapitanov, ulitsa Iriny Levchenko, 3, kv. 9; Svetlana V. Kolosova, Zarevy proezd, 15, kv. 28; Vyacheslav D. Kolesnikov, Grokholsky pereulok, 30, korpus 2, kv. 65, all of Moscow, and Vladimir P. Kharchenko, Krasnogorsky raion, p/o Stepanovskoe, 18, kv. 28, Moskovskaya oblast, all of U.S.S.R.

Filed Nov. 18, 1976, Ser. No. 743,000

Claims priority, application U.S.S.R., Dec. 19, 1975, 2301823

Int. Cl.² B25C *5/02*

U.S. Cl. 227—108 **7 Claims**



1. A surgical instrument for suturing with metal staples, comprising an anvil unit including a pair of elongated jaws situated in alignment with each other and respectively having inner surfaces formed with guiding grooves for a staple, said jaws terminating in front ends, said unit including two anvils for bending the tips of a staple, said anvils respectively being fixed to front ends of said jaws and being shaped as needles which are curved at approximately 90° and which terminate in tips which are directed toward each other, said anvils being formed with longitudinal grooves which form extensisons of said grooves of said jaws, said unit also including a means operatively connected with said jaws for releasably holding them together in a position wherein said longitudinal grooves at said inner surfaces of said jaws are approximately parallel to each other, and a staple-driving unit including a frame having means for detachably mounting the same on said jaws, said frame also being formed with grooves for receiving and holding a staple with the latter grooves also forming extensions of said jaws grooves, said staple-driving unit including a staple-driving member situated in said frame for propelling a staple toward said anvils, and said staple-driving unit also including a lever operatively connected with said staple-driving member for operating the same to propel a staple toward said anvils.

4,122,990

PORTABLE FRICTIONAL WELDING DEVICE

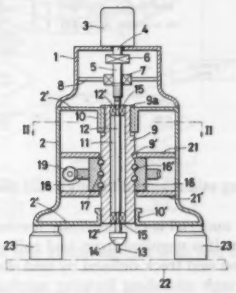
Yoshio Tasaki; Noboru Nakayama, both of Nagoya, and Hiroshi Kajihara, Kohnan, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 748,880

Claims priority, application Japan, Dec. 11, 1975, 50-148237

Int. Cl.² B23K *19/02*

U.S. Cl. 228—2 **9 Claims**



1. A portable frictional welding device for welding an object which comprises:

a casing;

a rotary shaft disposed within said casing;

means provided at the lower portion of said rotary shaft for grasping a metallic part to be subjected to welding;

a motor for rotating said rotary shaft;

a slidable cylindrical member provided with a spiral groove on the outer surface thereof for freely rotatably supporting said rotary shaft in the axial direction of said rotary shaft;

a sleeve provided with a matching spiral groove on the inner surface thereof and with a worm wheel on the outer surface thereof, and fitted to said cylindrical member to form a spiral path by the matched spiral grooves in which path a plurality of balls are inserted;

a torque motor for rotating said worm wheel for thereby sliding said cylindrical member in the axial direction of said rotary shaft; and,

fixing means provided on the bottom surface of said casing for positionally fixing said device with respect to the object to which said metallic part is to be welded.

4,122,991

APPARATUS FOR ASSEMBLING SPACE STRUCTURE

James D. Johnston, Madison; Richard H. Tuggle, Jr., Huntsville; John L. Burch, and Keith H. Clark, both of Decatur, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 31, 1977, Ser. No. 829,316

Int. Cl.² B64G *9/00*

U.S. Cl. 228—13 **14 Claims**

1. An apparatus for forming structures in outer space from rolls of prepunched ribbon material comprising:

a lower deck;

an upper deck;

legs extending between said upper deck and said lower deck;

means for supporting a roll of said prepunched material adjacent one end of said upper deck;

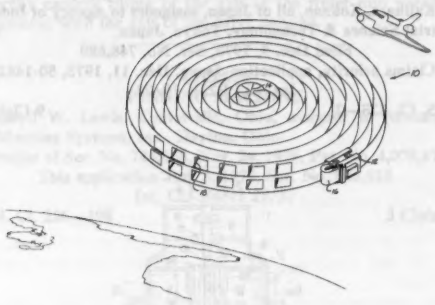
sheet forming mechanism carried by said upper deck;

means for feeding said material from said roll through said

sheet forming mechanism for imparting a predetermined circular shape to said ribbon material defining a track; and

drive means carried in said lower deck for propelling said apparatus on said track;

means for synchronzing said drive means with said means



for feeding said material through said sheet forming mechanism;

whereby said material is continuously formed into a predetermined shape as it is unrolled from said roll and as said apparatus is moved on said track defined by said sheet material previously fed through said sheet forming mechanism.

4,122,992

METHOD OF MAKING A COMPOSITE INTERLAYER FOR DIFFUSION BONDING

David S. Duvall, Cobalt, and Daniel F. Paulonis, Moodus, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 642,627, Dec. 19, 1975, Pat. No. 4,038,041. This application May 2, 1977, Ser. No. 792,628

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—176 **9 Claims**

1. A process for producing a ductile lamellar interlayer containing a melt depressant useful in the transient liquid phase bonding of metallic articles which includes the steps of:

a. providing a plurality of ductile lamellae having an overall composition which is similar to that of the articles being joined (exclusive of the melting point depressant),

b. bonding the lamellae together by co-rolling to produce a unitary ductile interlayer,

c. applying boron to the surface of the bonded lamellae by a boronizing process.

4,122,993

PRESSURE-EQUALIZING VALVE FOR A PACKAGING CONTAINER

Willi Glas, Renningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

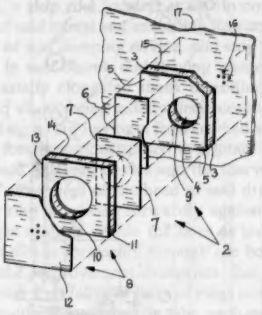
Filed Aug. 16, 1976, Ser. No. 714,636

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1975, 2537317

Int. Cl.[2] B65D *31/14*

U.S. Cl. 229—62.5 **11 Claims**

1. A pressure-equalizing valve suitable for use with packaging containers, said valve comprising a substantially rigid valve seat having a pair of opposed faces with a valve opening therebetween, an adhesive coating at least on one of said opposed faces on said valve seat, a flexible valve diaphragm at least partially surrounding and substantially covering said valve opening on said face with said adhesive coating of said valve seat, a separation layer secured to at least a portion of said adhesive coating on said face of said valve seat and at least partially surrounding said valve opening and being positioned between said coated face and said flexible valve diaphragm whereby there is provided a pressure-equalizing passage extending from said valve opening through said flexible valve



diaphragm, and a gas pervious protective covering placed in fixed relation to the container and valve seat.

4,122,994

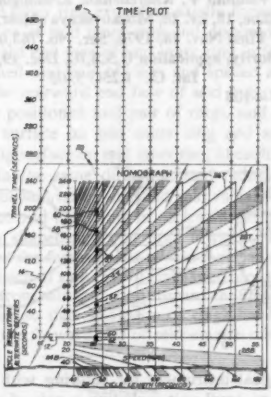
METHOD AND MEANS FOR DETERMINING OPTIMUM AVERAGE CYCLE LENGTHS

Marshall B. McReynolds, and Jack D. VanTilbury, both of Arlington, Va., assignors to Traffic Engineers Supply Corporation (TESCO), Alexandria, Va.

Filed Oct. 20, 1976, Ser. No. 734,125

Int. Cl.[2] G06C *3/00*

U.S. Cl. 235—89 R **5 Claims**



1. A computational device for determining optimum average cycle lengths for an arterial traffic control system, which comprises:

(a) a base member;

(b) a transparent overlay member;

said base member having indicia representative of a portion of a speed scale arrayed along a first axis, and indicia representative of a portion of a travel time scale arrayed along a second axis, said base member having a plurality of spaced, constant speed lines emanating from said first axis and disposed parallel to said second axis, whereby a first grid representative of speed versus travel time is obtained;

said overlay member having indicia representative of average cycle lengths in units of time and forming a portion of a time scale arrayed along a first axis, and indicia representative of cycle resolution centerpoints arrayed along a second axis, said overlay member having a plurality of lines extending ray-like from said centerpoints, pairs of

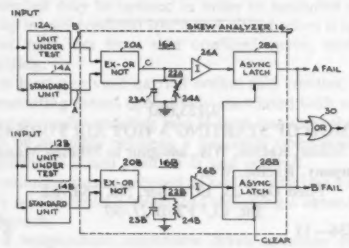
adjacent ray-like lines defining first and second acceptable cycle length zones therebetween and an unacceptable cycle length zone positioned between said first and second acceptable cycle length zones, each zone extending ray-like between each pair of adjacent ray-like lines, whereby a second grid representative of average cycle length versus cycle resolution centerpoints is obtained; and

(c) said first and second grids having predetermined scale factor relationships which cooperate as the overlay member is shiftably aligned with the base member so as to produce an overlapping display of points plotted on constant speed lines of said base member with acceptable cycle length zones of said overlay member.

4,122,995
ASYNCHRONOUS DIGITAL CIRCUIT TESTING SYSTEM

Robert H. Franke, Santa Barbara, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 2, 1977, Ser. No. 821,118
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—302 **9 Claims**



1. Means for testing a digital unit comprising:

a standard unit to which it is desired that said digital unit conform;

digital signal input means for concurrently applying a test input signal to said digital unit and to said standard unit;

skew analyzer means to which the outputs of said digital unit and said standard unit are continuously and asynchronously applied, said skew analyzer means being operative to determine when the outputs of said units are out of skew for a time greater than an adjustable predetermined minimum time period; and

indicating means responsive to the determination by said skew analyzer means of an out of skew condition for at least said predetermined minimum time period for providing an output signal indicative of a potential or actual failure of said digital unit.

4,122,996
COPY REPRODUCTION MACHINE WITH CONTROLLER SELF CHECK SYSTEM

Stephen P. Wilczek, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1977, Ser. No. 829,018
Int. Cl.[2] G11C *29/00*; G06F *11/00*
U.S. Cl. 235—302.3 **4 Claims**

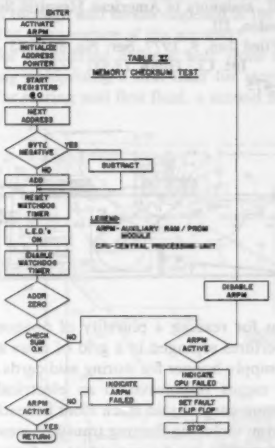
1. A method of operating a reproduction machine having a plurality of components which cooperate with one another and a photosensitive member to produce copies, said components being controlled by a controller having a memory section, said method comprising:

(a) sensing the application of power to the machine;

(b) totalizing the content of said memory;

(c) comparing the memory total with a first checksum;

(d) preventing actuation of the machine components if said



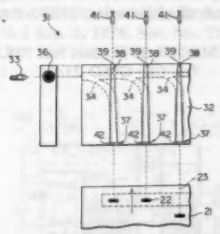
memory total fails to correspond with said first checksum; and

(e) displaying the cause of the failure.

4,122,997
OPTICAL READER

Mitsuhisa Fukuda, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 7, 1977, Ser. No. 766,152
Claims priority, application Japan, Feb. 6, 1976, 51-11977
Int. Cl.[2] G06K *7/10*; G08C *9/06*
U.S. Cl. 235—455 **14 Claims**



1. An optical reader for sensing the presence and absence of a mark in an area of a sheet comprising:

illuminating optical fiber means for conveying light to illuminate said area;

light sensor means; and

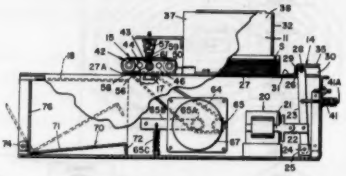
reading optical fiber means for conveying light reflected from said area to the light sensor means, a width of the reading optical fiber means in a direction parallel to the sheet and a distance of a light receiving end of the reading optical fiber means in said direction from a center of illumination of said area being selected so that a ratio of an amount of light conveyed to the light sensor means when the mark is absent to an amount of light conveyed to the light sensor means when the mark is present is a predetermined optimum value.

4,122,998

OPTICAL CARD READER APPARATUS

Vincent E. Eitzen, Marco Island, Fla., and Robert R. Moore, Glenview, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Jun. 9, 1977, Ser. No. 804,883
Int. Cl.[2] G06K *13/00, 7/10*
U.S. Cl. 235—475 **10 Claims**



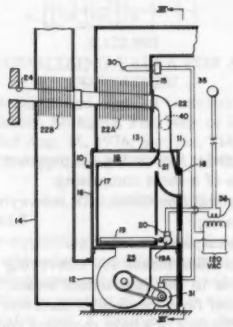
7. Apparatus for reading a plurality of opaque cards provided with apertures arranged in a grid of rows and columns comprising: a supply hopper for storing said cards in a vertical stack; pusher means responsive to an electrical signal for urging the bottom card of said stack from beneath said stack; driver mechanism including floating transport means provided with a pair of endless tracks, spaced at a distance approximately the width of a card and adapted to engage each card as it is urged from beneath said stack by said pusher means and for moving said cards sequentially along a reading path; a plurality of photodetectors mounted to said apparatus beneath said path and spaced apart at a distance corresponding to the spacing of said columns on said cards; and a source of light mounted to said supply hopper for generating a line of light parallel to the rows of said cards as they pass along said path beneath said transport means, said line of light being further focused on said photodetectors, whereby for each row of apertures in said cards, individual photodetectors will be energized by said source only if said card is apertured at the location above it as the card passes along said path.

4,122,999

FORCED AIR HEATING SYSTEM

Rosario Belcastro, deceased, late of Ambridge, Pa., and by Patricia Belcastro, administratrix, 1813 3rd Ave., New Brighton, Pa. 15066

Filed Mar. 17, 1977, Ser. No. 778,357
Int. Cl.[2] G05D *23/00*
U.S. Cl. 236—11 **7 Claims**



1. A forced air heating system including a chimney for exhausting burnt gases due to the burning of a fuel comprising the combination of:

a furnace housing,

a cold air supply duct connected to said furnace housing,

a driven blower in said furnace housing receiving air from said cold air supply duct,

a plenum chamber receiving air from said driven blower,

a combustion chamber including a burner for the combustion of fuel to heat the air delivered by said driven blower to said plenum chamber,

a flue duct communicating with said combustion chamber for exhausting burnt gases from the furnace housing,

a flue pipe extending from said flue duct through said plenum chamber and said cold air supply duct and then into said chimney for conducting burnt gases received from said flue duct to the chimney, said flue pipe including heat exchange means in said plenum chamber for withdrawing sensible heat from the burnt gases before passing into said chimney,

control means secured in said plenum chamber at a spaced location above said flue pipe passing therethrough to respond to the temperature of the air heated by said flue pipe while passing upwardly through said plenum chamber for controlling said driven blower, and

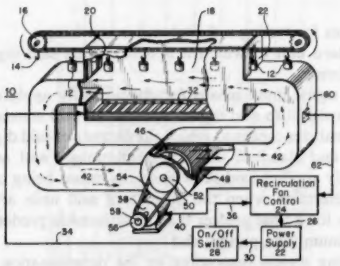
a thermostat means providing a signal for the delivery of fuel to said burner.

4,123,000

METHOD OF STARTING A HOT AIR FURNACE

Robert F. Miller, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Dec. 23, 1976, Ser. No. 753,702
Int. Cl.[2] F26B *21/00*
U.S. Cl. 236—11 **6 Claims**



1. In a hot air recirculating furnace system having a heating element and means for igniting the heating element, a thermostat, air ducts adapted to provide recirculating airflow, a three-phased inductor motor for driving a recirculating fan, a three-phased power supply for providing power to the motor comprising:

a first contact means coupled to each of the three phases of the power supply for providing current flow therethrough when closed;

resistive means coupled between the power supply and the motor for providing a current path from the power supply to the motor;

a second contact means coupled between the power supply and the motor for providing an alternate current path from the power supply to the motor;

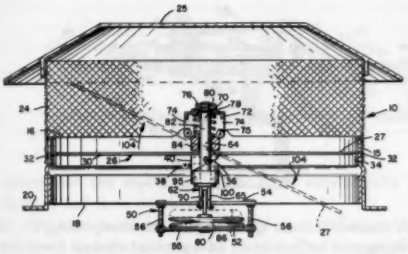
a first controller means for controlling the opening and closing of the first contact means; and

a second controller means responsive to the thermostat for controlling the current flow through the alternate current path.

4,123,001
AUTOMATIC VENTILATOR

Stanley Kolt, Mamaroneck, N.Y., assignor to Leonard W. Surloff, Jericho, N.Y., a part interest

Filed Sep. 12, 1977, Ser. No. 832,482
Int. Cl.[2] F24F *11/02*
U.S. Cl. 236—49 35 Claims



1. An automatic temperature responsive damper assembly for use within the conduit of a ventilating system designed to exhaust the air in a confined space to the atmosphere whereby said conduit may be opened in order to minimize excess heat build up in said confined space and closed when it is desired to prevent heat loss from said confined space, said assembly comprising:

A. at least one vane carried within said conduit,

B. mounting means operatively associated with said conduit for pivotally securing said at least one vane thereto, so as to be movable between a generally open position and a generally closed position in said conduit,

C. camming means secured to said at least one vane carried by said mounting means and including a camming surface thereon,

D. a temperature responsive drive assembly mounted to detect temperature changes in said conduit and adapted to actuate in response to temperature changes within a predetermined range,

E. transmission means operatively extending between said drive assembly and said camming surface of said camming means for communicating movement of said drive assembly to said camming means, such that said at least one vane is moved to varying positions in response to temperature changes in said ventilating conduit, and

F. biasing means for urging said camming means into contact with said transmission means in a direction opposite to the forces applied by said drive assembly, so as to obtain an automatic closing of said at least one vane irrespective of the mounted position of said conduit.

4,123,002
HEATING AND VENTILATION SYSTEM

Norman B. Saunders, 15 Ellis Rd., Weston, Mass. 02193

Continuation-in-part of Ser. No. 639,305, Dec. 30, 1975, abandoned, which is a division of Ser. No. 529,235, Dec. 3, 1974, Pat. No. 3,952,947. This application Aug. 3, 1977, Ser. No. 821,416
Int. Cl.[2] F24J *3/02*
U.S. Cl. 237—1 A 8 Claims

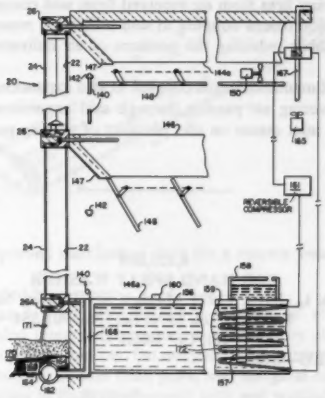
1. A system for controlling the temperature, ventilation and humidity within an enclosed building comprising:

means disposed in the ground exterior to said building for changing the temperature and relative humidity of air passing therethrough, said means disposed in the ground including piping communicating with the interior of said building and having at least a portion disposed exterior of said building below the frost line, said portion of piping including at least one aperture for introducing exterior air from the ground into said piping;

means for drawing air from the exterior of said building to the interior of said building through said means disposed in the ground so as to change the relative humidity of the air drawn therethrough;

solar heating means for adding to the heat content of the air drawn through said means disposed in the ground so as to raise the temperature of the air; and

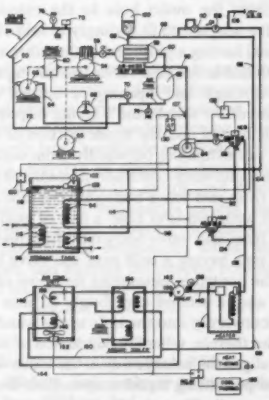
means for recovering exhaust heat from air leaving said building comprising a first fluid for storing said heat, a tank for storing said first fluid, a second fluid, a compressor for compressing said second fluid, heat exchanger means for transferring heat from air leaving the interior of said enclosure to said second fluid when heat is to be stored and transferring from said second fluid to air leaving the interior of said enclosure when heat is to be released from said system, and conduit means including a coil disposed in said tank for transferring heat between said first and second fluids so as to provide a condensor when said heat is to be stored in said tank.



4,123,003
SOLAR ENERGY COLLECTION PANELS AND ENERGY RECOVERY SYSTEMS

Theodore Winston, 643 Stanford Rd., Burbank, Calif. 91504

Filed Sep. 3, 1976, Ser. No. 720,126
Int. Cl.[2] F24J *3/02;* F25B *27/00*
U.S. Cl. 237—1 A 20 Claims



1. A system for recovering solar energy comprising:

a plurality of roofing panels, each having a decorative outer surface with an air flow path thereunder, each of said

panels having inlet means adjacent one end of said flow path for delivering air thereto and outlet means adjacent the second end of said flow path for receiving air therefrom;

a compressor for compressing air delivered thereto;

a first manifold means coupled between said outlet means and said compressor to deliver heated air from said panels to said compressor;

heat utilization means coupled to said compressor for removing heat from air received from said compressor;

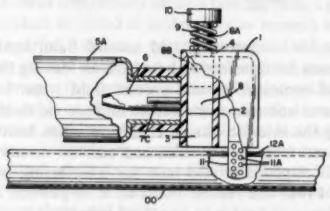
expansion means coupled to said utilization means for controllably reducing the pressure of air delivered thereto; and

second manifold means coupled to said expansion means for delivering air passing through said expansion means to said inlet means on said plurality of roofing panels.

4,123,004
CAR HAND SPRAY WASHER

Frederick L. Jerry, 13971 Mubbell St., Detroit, Mich. 48227

Filed Jun. 24, 1976, Ser. No. 701,354
Int. Cl.[2] B05B 7/30
U.S. Cl. 239—310 1 Claim

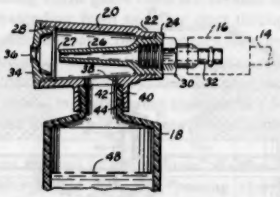


1. In a spray washer of the type wherein a wand has a brush at one end and is connected to a source of water under pressure at the other end, and a liquid soap container is connected to the wand such that liquid soap flows from the container into the wand through a hole therein to mix with water flowing through the wand, the improvement comprising: a valve body connecting the liquid soap container to the wand, said valve body including: a valve chamber having aligned inlet and outlet holes and an opening through an upper portion; a cavity extending from the outlet hole to the exterior of the valve body; a valve adapted to fit slidingly in said chamber between said holes and having a passageway therethrough which can be aligned with said holes, said valve also having a threaded shank extending through said opening, a button screwed onto a threaded end of the shank, and a spring disposed on said shank between the button and the upper portion of the valve chamber; a first cap extending outwardly from said valve body for holding the liquid soap container; a needle-like tube extending outwardly from said valve body into the liquid soap container and aligned with said inlet hole; a pair of guide pins extending outwardly from said valve body into the liquid soap container, one of the pins having a hole near the valve body to regulate the air in the container permitting free flow of soap out of the container; and, a second cap snugly fit into said cavity and extending outwardly into the hole in the wand, the second cap having holes therein, whereby depression of the button against the spring aligns the passageway in the valve with the inlet and outlet holes permitting liquid soap to flow from the container through the needle-like valve, the inlet hole, the valve passageway, the outlet hole and the cavity into the second cap wherein the liquid soap is mixed with the water flowing through the wand.

4,123,005
ACOUSTICAL TEXTURE APPLICATOR

Glenn I. Blunk, Rte. 1, Box 91, Oklahoma City, Okla. 73111

Continuation-in-part of Ser. No. 705,371, Jul. 14, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,774
Int. Cl.[2] B05B 7/14; B65D 1/32
U.S. Cl. 239—327 1 Claim



1. A viscous texture spray applicator, comprising:

an elongated hollow body of truncated conical form having an internally threaded forward end and a rearward inlet end forming a viscous fluid passageway throughout the major portion of its length tapering outwardly from its inlet end;

an elongated air tube coaxially disposed within said body and connected at one end with the inlet end of said body and being gradually reduced to a restricted extremity at its other end and terminating adjacent the inner limit of the forward end body threads for axially concentrating a stream of air flowing toward the forward end of said body;

a tubular fitting connected with said air tube opposite its restricted extremity and adapted to be connected with a source of air under pressure;

an end member threadedly connected with the forward end of said body,

said end member having an axial dish-shaped recess facing toward said air tube diametrically substantially equal with respect to the diameter of the fluid passageway at the forward end of said body and having an orifice coaxially aligned with and spaced forwardly of the restricted extremity of said air tube a distance at least greater than the depth of the recess,

said body having a lateral port, diametrically at least equal with respect to the transverse cross sectional area of the fluid passageway surrounding said air tubs at the inlet end of said body, intermediate its ends surrounded by an outstanding flange; and,

a flexible wall fluid container having an open neck portion adapted to be secured to said body flange,

hereby external pressure continuously applied to opposing exterior surfaces of said container forces contained viscous fluid through the lateral port to fill the fluid passageway and end member recess and be blown through the orifice by the air stream flowing toward the forward end of said body.

4,123,006
SPRAY PIPE FOR USE IN A PIPE LINE

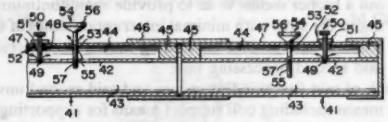
Tuyoshi Yukishita, No. 77, Aza Tenpaku, Tenpaku-cho, Toyohashi-shi, Aichi, Japan, assignor to Osamu Shiina, Tokyo and Tuyoshi Yukishita, Toyohashi, both of, Japan

Filed Jun. 10, 1976, Ser. No. 694,538
Claims priority, application Japan, Jun. 20, 1975, 50-83658[U]
Int. Cl.[2] B05B 1/20
U.S. Cl. 239—266 6 Claims

1. A pipe line comprising:

a plurality of spray pipe units, each of said pipe units having their opposite ends open and including a partition provided within the inner space thereof so as to divide said inner space into a main space and a secondary space, at least one spray hole provided within the outer peripheral

wall of the pipe defining said secondary space, a plug member positioned within each of the opposite ends of the secondary space so as to seal the same, means for fluidically communicating the main space with the secondary space, and means for adjustably restricting said communicating means between fully restricted and non-restricted states so as to adjust the flow rate of fluid from the main



space into the secondary space from substantially zero flow to full flow conditions;

said pipe units being serially disposed in an end-to-end manner such that the main spaces of said pipe units are fluidically communicated with each other; and

sleeve-shaped coupling means disposed about the joints of said pipe units defined by the adjacent ends thereof for connecting said pipe units together in a sealed manner.

4,123,007

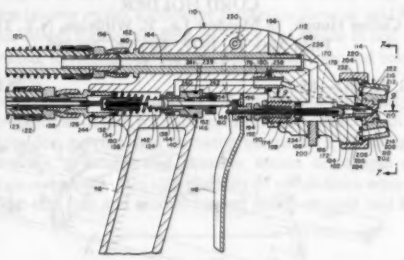
VALVE ASSEMBLY AND SPRAYING APPARATUS THEREFOR

Charles R. Gardner, 1549 Wilder St., Thousand Oaks, Calif. 91360

Continuation-in-part of Ser. No. 714,222, Aug. 13, 1976, abandoned, and Ser. No. 647,688, Jan. 9, 1976, abandoned, said Ser. No. 714,222, is a continuation of Ser. No. 571,456, Apr. 25, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,667

Int. Cl.² B05B *7/08*

U.S. Cl. 239—414 **31 Claims**



1. Apparatus for mixing two components comprising:

a chamber having an inlet and an outlet;

a housing secured in said chamber;

at least one passageway between the exterior of said housing and the interior of said chamber;

said housing having a bore;

an expendable valve assembly installed in said bore, said expendable valve assembly being independent of said housing;

mechanical means for opening and closing the valve in said expendable valve assembly;

first conduit connecting means on said housing for delivering a first component to said expendable valve assembly at the inlet side of said chamber;

second conduit connecting means for delivering a second component to the inlet side of said chamber;

whereby opening of the valve in said expendable valve assembly causes the two components to be mixed in said chamber for delivery to the outlet.

4,123,008

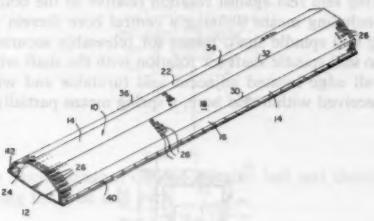
REACTOR DISTRIBUTION DUCT

Robert Woodrow McClain, Dallas, Tex., assignor to Glitsch, Inc., Dallas, Tex.

Filed Feb. 4, 1977, Ser. No. 765,717

Int. Cl.² B01J *8/12*

U.S. Cl. 239—568 **5 Claims**



1. An improved distribution duct for a reactor vessel comprising:

an elongated back plate;

an elongated front plate having a plurality of elongated perforated integral flat segments separated by elongated angular breaks, and two flat marginal edge portions on the opposite sides of said front plate, said marginal edge portions being in flush engagement with and welded to said back plate adjacent to the sides thereof, said flat segments defining with said back plate a flow chamber.

4,123,009

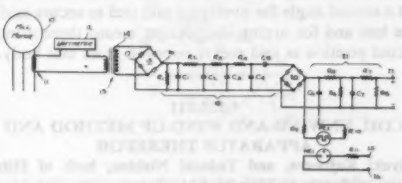
LOAD SENSOR FOR A GRINDING MILL

Leo T. Kilpinen, Sudbury, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 470,169, May 14, 1974, abandoned. This application Mar. 25, 1976, Ser. No. 670,414

Int. Cl.² B02C *4/04*; H02P *3/00*; G01R *31/02*

U.S. Cl. 241—30 **4 Claims**



1. In the operation of a rod mill driven by an electric motor said rod mill having a plurality of rods for crushing ore, an improved method of monitoring said operation for incipient tangle of the rods comprising: predetermining a band of frequencies of relatively large amplitude associated with an incipient tangle of rods, deriving an electrical signal which is proportional to current drawn by the motor, and filtering out of said signal substantially all frequencies except those in the predetermined band, thereby enabling the detection of the occurrence of characteristic frequencies within the specific band of frequencies, and altering the process conditions in the rod mill to avoid incipient tangle of the rods.

4,123,010

ADAPTER HUB FOR A REEL

Donald M. Eger, Elkhart, Ind., assignor to International Radio & Electronics, Inc., Elkhart, Ind.

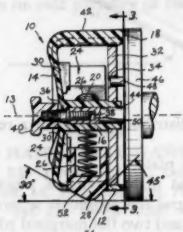
Filed Jan. 2, 1975, Ser. No. 537,936

Int. Cl.² B65H *17/02*

U.S. Cl. 242—68.3 **9 Claims**

1. An adapter hub for a reel, said hub being mountable to a

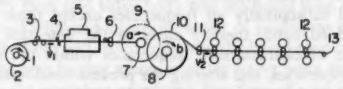
spindle shaft carried upon a turntable and comprising a body defined by a continuous side wall and an end wall, said side wall including an edge oppositely located from said end wall and having at least two openings formed therein angularly disposed about the side wall and spaced between said side wall edge and said end wall, a plunger means carried by said body and received within each side wall opening, said body including lug means projecting outwardly from said side wall for anchoring said reel against rotation relative to the body, said body including means defining a central bore therein for receiving said spindle shaft, means for releasably securing said body to said spindle shaft for rotation with the shaft with said side wall edge located adjacent said turntable and with the shaft received within said bore, a spring means partially compressed between and contacting said bore defining means and each plunger means for urging each plunger means laterally of said side wall into an extended position projecting outwardly from its side wall opening, each plunger means being shiftable with the compressive yielding of its contacting spring means into a retracted position within said body, each plunger means including a generally V-shaped reel contacting part which projects from said side wall when the plunger means is in its extended position, each reel contacting part including a first beveled face means extending at a first angle for urging the plunger means thereof into its retracted position as said reel is fitted onto said body and a second beveled face means extending at a second angle for overlying said reel to secure said reel to the hub and for urging the plunger means thereof into its retracted position as said reel is removed from said body.



4,123,011
COIL UNWIND AND WIND-UP METHOD AND APPARATUS THEREFOR

Toshiyuki Kajiwara, and Tadashi Nishino, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 657,234, Feb. 11, 1976, abandoned. This application Oct. 6, 1977, Ser. No. 839,772
Claims priority, application Japan, Feb. 19, 1975, 50-20615; Apr. 25, 1975, 50-49629; Jul. 2, 1975, 50-80803
Int. Cl.[2] B21C *47/02, 47/16, 47/24*
U.S. Cl. 242—78.1 **8 Claims**

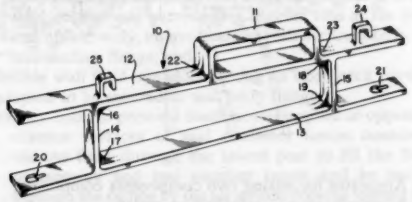


1. A coil handling apparatus comprising:
first means for unwinding a strip from a plurality of coiled strips of an ordinary size;
first joining means for joining the trailing end of a preceding strip of one of a plurality of coiled strips to the leading end of a next succeeding strip from another of the plurality of coiled strips, said first unwinding means and first joining means being arranged in a first processing line;
processing means arranged in a second processing line parallel to and spaced from said first processing line for processing the joined strip;
first winding means for winding the joined strip to form a larger diameter coiled strip up to at least ten times the size of an ordinary size coiled strip, said winding means being arranged in said first processing line;
second unwinding means for unwinding and feeding said large diameter coiled strip to said processing means without a looper means so as to provide semi-continuous feeding to the strip with minimal interruption times of the strip feeding, said second unwinding means being arranged in said second processing line;
each of said first winding means and said second unwinding means including coil support means for supporting a large diameter coil thereon and being alternately displaceable between said first and second processing lines for utilization in winding and unwinding; and
means for rapidly and easily moving said coil support means of said first winding means having said large diameter coiled strip wound thereon in the axial direction thereof from said first processing line to said second processing line to enable unwinding of said strip therefrom and to provide for semi-continuous feeding of the strip and for moving said coil support means of said second unwinding means in the axial direction thereof from the second processing line to said first processing line to enable winding of the strip thereon.

4,123,012
CORD HOLDER

W. Colton Hough, 18 Meadow La., E. Williston, N.Y. 11596

Filed May 12, 1977, Ser. No. 796,086
Int. Cl.[2] B65H *75/36*
U.S. Cl. 242—85.1 **2 Claims**



1. An integral cord holder comprising:
side walls disposed substantially parallel to each other;
an upper cross member connecting the upper portions of said side walls;
a lower cross member connecting lower portions of said side walls;
said cross members being substantially parallel to each other;
a reinforcing rib at the juncture of said upper cross member to said portions of said side walls;
a reinforcing rib at the juncture of the said lower cross member to said lower portions of said side walls;
a handle integral with one of said side walls;
reinforcing ribs at the juncture of said handle to said side walls;
a clip integral with one of said side walls for receiving the enlarged end of an extension cord whereby said enlarged end is secured for storage.

4,123,013

SAFETY BELT REWINDING MECHANISM WITH IMPROVED RETRACTION CHARACTERISTICS

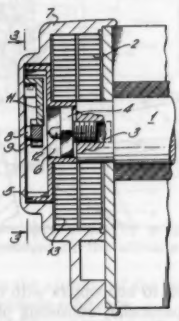
John Bottrill, Chichester, and Douglas J. Cunningham, Steep Marsh Nr. Petersfield, both of England, assignors to Britax (Wingard) Limited, Chichester, England

Filed Dec. 28, 1976, Ser. No. 755,095

Claims priority, application United Kingdom, Jan. 7, 1976, 490/76

Int. Cl.[2] A62B *35/02;* B65H *75/48*

U.S. Cl. 242—107 16 Claims



1. A safety belt retractor comprising: a safety belt; rotatable means for storing said belt; first and second means for biasing said rotatable means in a belt retracting direction, said first biasing means applying a light retraction force to said belt when worn, said first and second biasing means rewinding said belt on said rotatable means when said belt is not worn; lock-out means for disconnecting the bias of said second biasing means from said rotatable means, said lock-out means causing energy derived by pulling said belt from said rotatable means to be stored in said second biasing means, whereby only one said first biasing means applies the retraction force to said belt; actuator means for disengaging said lock-out means as said belt is retracted, to release said stored energy in said second biasing means; and,

counter means, responsive to a predetermined plurality of revolutions of said rotatable means in the retraction direction, for moving said actuator means to a disengaging position, whereby said actuator means disengages said lock-out means after said plurality of revolutions whereby both said first and second biasing means rewind said belt.

4,123,014

YARN TENSION CONTROL

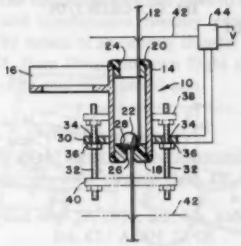
Robert W. McCullough, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 779,292, Mar. 21, 1977, abandoned. This application Nov. 25, 1977, Ser. No. 855,039

Int. Cl.[2] B65H *59/24*

U.S. Cl. 242—152.1 2 Claims

1. A yarn tension control device comprising: an elongated housing, means forming a yarn outlet in said housing, means forming a yarn inlet in said housing, a first eyelet mounted in said yarn inlet in said housing having a first opening therethrough for the passage of yarn, a second eyelet mounted in said yarn outlet having a second opening therethrough having a diameter greater than the diameter of said first opening, a metallic ball freely supported in said housing on said first eyelet for applying a retarding force to a yarn passing through said eyelets, an electro-magnet mounted adjacent to and operably associated with said metallic ball for applying a force to said metallic ball and means adjacent said yarn outlet responsive to the tension on the yarn exiting from said yarn outlet to regulate the current to said electro-magnet to adjust the force



of the electro-magnet on said metallic ball and thereby said retarding force on said yarn.

4,123,015

AUTOMATIC STOPPING DEVICE FOR TAPE RECORDER

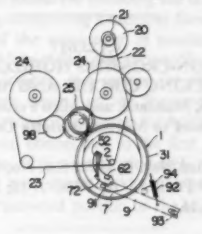
Fumito Komatsu, Suwa, and Shinkichi Yazima, Chino, both of Japan, assignors to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Jan. 5, 1978, Ser. No. 866,950

Claims priority, application Japan, Jan. 20, 1977, 52-5627; Jan. 20, 1977, 52-5628

Int. Cl.[2] B65H *59/38;* G03B *1/02*

U.S. Cl. 242—191 3 Claims



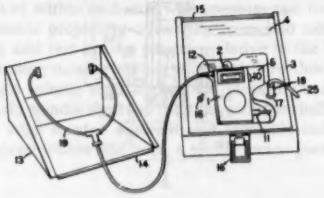
1. An automatic stopping device for tape recorder comprising a flywheel, a detection wheel disposed in overlying relationship with the flywheel and disposed for engagement with a tape feed member such as a reel mount or an idler connected therewith, a spring, a slide control member having a sliding wall and urged for rotation in one direction by said spring which has its one end connected with the flywheel, an operation release lever, a displacement member didposed for movement along the sliding wall of the control member and carrying a pin which bears against said operation release lever and also carrying a guide, and a base plate including a guide slot formed therein for receiving the pin to control the extent of movement of the displacement member and also including a guide pin located adjacent the guide of the displacement member for controlling the movement of the displacement member in the radial direction, the arrangement being such that when the tape feed member ceases to move to produce a load which causes the detection wheel to be angularly displaced with respect to the flywheel, the pin on the displacement member is driven in the radial direction onto a path of rotation of a greater diameter along which it is capable of engaging the release lever, thus actuating the release lever.

4,123,016

CONTROL FOR MINI TAPE RECORDER

William J. Burstein, 92 Brook Ave., Deer Park, N.Y. 11729

Filed Nov. 25, 1977, Ser. No. 854,518
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—201 1 Claim



1. Means to adapt a mini-tape recorder of the hand held type having a reverse wind control for transcribing control by a secretary comprising,

means to mount the mini-tape recorder,

comprising a mounting member with a slanting front face,

the front face having a recess adapted to receive the mini-tape recorder, the recess being formed so as to accommodate a power plug and head set plug inserted into the mini-tape recorder and to provide easy access to the volume control of the minitape recorder,

a solenoid in the mounting means adapted to actuate the reverse wind control,

foot operation switch means having two contacts, one contact being connected to actuate the tape recorder in the forward direction and the other contact being connected to the solenoid to actuate the rewind control to cause the tape to move in the reverse direction,

a removable cover for the mounting means, the cover being adapted to accommodate a head set and foot control.

4,123,017

DUAL, NON-CROSSING HORIZONTAL GATE TRACKING CIRCUIT AND METHOD

George R. Lewis, Maitland, and Allen Fernandez, Orlando, both of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed Nov. 9, 1970, Ser. No. 88,089
Int. Cl.[2] F42B *15/10*; F42G *7/10*; F42B *15/00*
U.S. Cl. 244—3.16 11 Claims

1. Apparatus comprising:

means for producing a transduced electrical signature of an optical image of a target within a field of view;

first detector means for detecting a first edge of the optical image of the target;

second detector means for detecting a second edge of the optical image of the target;

target center detector means responsive to said first and second detector means for detecting a point on the target between the detected edges thereof; and

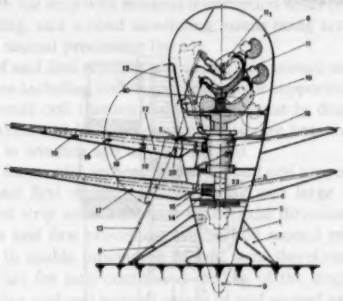
means responsive to said target center detector means for generating an electrical error signal related to the departure of the detected target center from the center of the field of view.

4,123,018

HELICOPTERS WITH COAXIAL ROTORS, OF CONVERTIBLE TYPE IN PARTICULAR

Rene C. A. Tassin de Montaigu, 6, Square d'Orleans, Paris, France

Continuation of Ser. No. 648,535, Jan. 12, 1976, abandoned. This application May 16, 1977, Ser. No. 797,486
Int. Cl.[2] B64C *27/10*
U.S. Cl. 244—17.23 13 Claims



1. Improvements to helicopters with coaxial rotors of convertible type in particular, consisting of at least two contra rotative rotors carrying blades having a coating for lifting and propelling, the fuselage having an axis common with the axes of the rotors and rocking jointly with the latter between substantially vertical and horizontal positions, improvements wherein each rotor consists of a nave carrying blades radially arranged, and said blades being movable in incidence and cyclically controlled and further comprising,

a shaft coaxial with said fuselage axis inside said fuselage forming a structural member of said fuselage,

and means for supporting the rotor naves axially displaced along and rotatable about said shaft,

said helicopter being free of fixed wings with said rotors being the sole means for providing lift when said fuselage is vertical and horizontal in flight,

propulsive transmissions and flight control systems external to said shaft,

engine means axially displaced from said shaft inside said fuselage embracing the common axis of said shaft and fuselage coupled to said propulsive transmission for providing driving power to said rotors,

wherein the incidence of the blades coating is driven by two cyclic plates located between the rotors and related to each of said rotors.

4,123,019

METHOD AND SYSTEM FOR GRAVITY COMPENSATION OF GUIDED MISSILES OR PROJECTILES

David S. Amberntson, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 10, 1976, Ser. No. 740,740
Int. Cl.[2] G06F *15/50*
U.S. Cl. 244—3.2 17 Claims

1. A system for producing a signal to compensate the flight path of a guided missile or projectile for the effects of gravity comprising:

means mounted in the missile or projectile for establishing an attitude reference axis independent of the attitude of the missile or projectile;

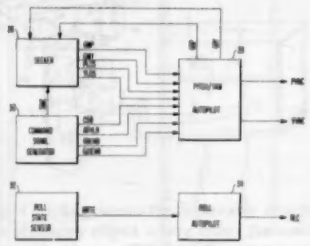
means for sensing an angular difference between the attitude of the missile or projectile and the attitude reference axis;

means for generating a gravity compensation signal in response to the sensed angular differences between the attitude of the missile or projectile and the reference axis;

means for storing said generated gravity compensation signal; and

means for compensating the flight path of the missile or projectile in response to the stored gravity compensation signal.

12. A method for dynamically producing a gravity compensation signal for compensating the flight path of a missile or projectile comprising the steps of:



establishing, within the missile or projectile, an attitude reference independent of the attitude of the missile or projectile;

sensing changes in the attitude of the missile or projectile relative to the attitude reference;

generating a gravity bias signal in response to the sensed changes in the attitude of the missile or projectile relative to the attitude reference; and,

storing the gravity bias signal for subsequent modification of the flight path of the missile or projectile.

4,123,020

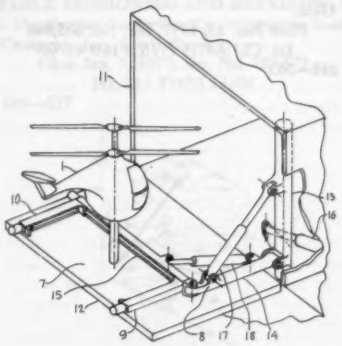
VTOL LAUNCHING AND RETRIEVAL SYSTEMS

Kazimierz Korsak, 1568 Ellsmere Ave., Los Angeles, Calif. 90019

Continuation-in-part of Ser. No. 660,642, Feb. 23, 1976, abandoned. This application Apr. 11, 1977, Ser. No. 786,683

Int. Cl.[2] B64F *1/22*

U.S. Cl. 244—116 **2 Claims**



1. A VTOL launching and retrieval system using in combination:

(a) a VTOL landing gear comprising in combination a single cylindrical stud having shock absorbing means, the structure of said stud being adequately rugged to withstand the clamping required to fully restrain said VTOL in a vertical direction by friction, without affecting the operation of said shock absorber and

(b) a retrieval means at the landing site having a mechanical arm comprising: two digits, at least one of which is movable in an essentially horizonal plane from an open position to a closed position to guide said stud into a slot formed by said digits in said closed position; said mechanical arm further comprising stud clamping jaws, at least one of which is movable in said slot to further guide said stud in said horizontal plane to a predetermined position where it can be clamped by said jaws to fully restrain said VTOL, said combination thereby providing a VTOL retrieval by means of an orderly transfer of the control of the VTOL from that of its own flight control system to the control of said mechanical arm.

4,123,021

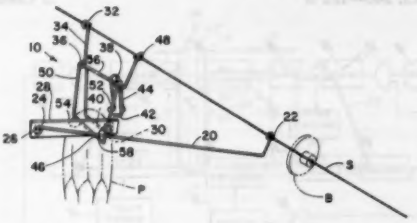
KITE LOAD-RELEASING MESSENGER

Claude R. Cruise, Jr., 2008 Virginia Hgts. Dr., Bluefield, W. Va. 24701

Filed Sep. 22, 1977, Ser. No. 835,457

Int. Cl.[2] A63H *27/08*

U.S. Cl. 244—155 R **9 Claims**



1. In a messenger for kites having means for slidably engaging a kite string having an obstruction thereon proximate a flying kite, the improvement comprising: the means for slidably engaging supporting a body having first and second jaws in opposed relation for releasably holding a parachute, means urging all said jaws apart, means for holding all said jaws together releasably, means for releasing the holding means; the means for releasing comprising a member forwardly extending from a first end of the messenger in position to strike said obstruction on said kite string, the forwardly extending member comprising a trigger, the means for slidably engaging including the trigger having at the forward end means for engaging said kite string; the means for holding including an arm having: a pivotal connection to the first jaw, a sear at an intermediate portion of the arm positionable with the arm for holding the second jaw proximate the first jaw, and a pivotal connection to the rearward portion of the trigger.

4,123,022

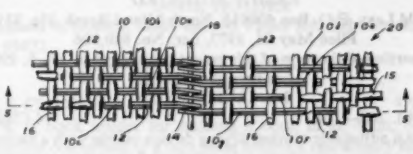
SEAM FOR FORMING WIRES AND DRYER FELTS

William H. Dutt, Rensselaer, and Eric R. Romanski, Delmar, both of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,609

Int. Cl.[2] B21F *15/06*

U.S. Cl. 245—10 **6 Claims**



1. A seam construction joining together the ends of a forming wire press fabric or felt or a dryer felt, which comprises;

the ends to be joined;

a plurality of eyepins having sinuously curved bodies, replacing terminal portions of the lengthwise yarns in each of said ends, said eyepins being anchored in the ends by an

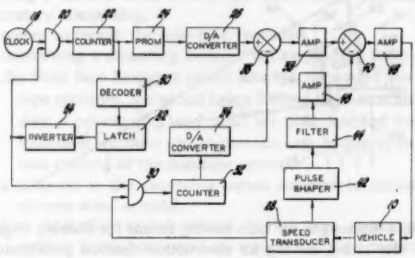
interweaving of the sinuous bodies with the crosswise yarns in the ends, the curves of the sinuous body mating with the crimp of the weave of said crosswise yarns, the eyes of said eyepins projecting from each end wherein the eyepin is anchored, said eyepins being positioned in the ends so that when the ends are brought together, the eyes of one end interleaf with the eyes of the other end; and

a joinder pin passing through the interleafed eyes of said eyepins whereby said ends are joined together.

4,123,023
SYSTEM FOR CONTROLLING VEHICLE MOVEMENT OVER A FIXED GUIDEWAY

Robert H. Nelson, Pleasant Ridge, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 3, 1977, Ser. No. 838,857
Int. Cl.² B61L *3/12*
U.S. Cl. 246—182 B **3 Claims**



1. A system for controlling the movement of a vehicle over a predetermined guideway comprising:

means effective to generate a command signal having a value representing a commanded absolute position of the vehicle on the guideway relative to a reference point on said guideway, the value of the command signal varying with time in a manner so as to represent desired vehicle motion characteristics;

means effective to provide a position signal having a value representing the actual absolute position of the vehicle on the guideway relative to the reference point;

means responsive to the command signal and the position signal effective to generate a velocity control signal having a value relating to the vehicle position error relative to the commanded position; and

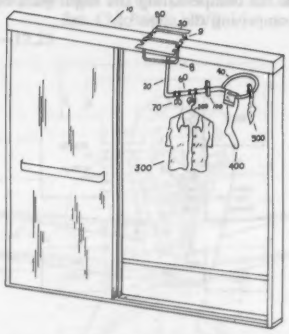
means effective to control the velocity of the vehicle in accordance with the magnitude of the velocity control signal, wherein the vehicle motion characteristics over the length of the pathway are controlled in accordance with the time related characteristics of the commanded absolute vehicle position on the guideway.

4,123,024
DEVICE FOR DRYING DRIP DRY APPAREL THAT IS EASILY ADJUSTED

Harold Levy, P.O. Box 600015, North Miami Beach, Fla. 33160

Filed May 26, 1977, Ser. No. 800,936
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.² E04G *3/00*
U.S. Cl. 248—214 **4 Claims**

1. An adjustable clothes drying device usable with a bathtub enclosure having a shower door beam of square cross section, the device comprising an adjustable clamp for fitting over the door beam and a cantilever arm horizontally extending outwardly from the clamp toward the interior of the bathtub enclosure, the clamp being constructed from an oblong plate of sheet material having opposite sides, said plate having at least three pairs of slots, one slot of each pair extending inwardly from one of said opposite sides and the other slot of each pair extending inwardly from the other of said opposite sides, said clamp further including a pair of spaced apart rectangular shaped clamping members, one of said clamping members engaging the slots of one of said pairs of slots and the other of said clamping members engaging the slots of another of said

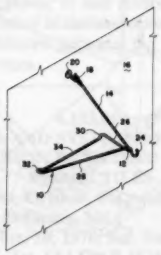


pairs of slots, whereby the position of said clamping members may be selected in accordance with the size of said door beam such that when the oblong plate is positioned against the top of the door beam the clamping members straddle the door beam to stabilize the drying device.

4,123,025
PYRAMIDAL HANGER FOR PLANTS OR LIKE ORNAMENTS

Donald R. Darragh, Tulsa, Okla., assignor to James V. Snow, Tulsa, Okla.

Filed Jun. 13, 1977, Ser. No. 805,846
Int. Cl.² A47H *1/16*; F16B *45/00*
U.S. Cl. 248—303 **2 Claims**

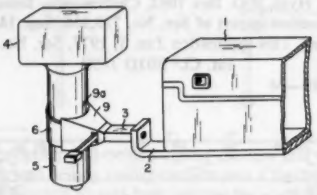


1. A pyramidal-shaped hanger for supporting plants or the like in horizontally spaced relation from a vertical wall comprising an arm adapted to extend downwardly and outwardly from an end of said arm which connects with said wall to a vertex point at the opposite end of said arm from said connecting end, a pair of legs connected to said arm only at said vertex point and extending divergently inward towards said wall from said vertex point, a substantially horizontal cross-piece connecting the ends of said legs opposite from the ends thereof which connect with said arm, and hook means at said vertex point.

4,123,026
OBJECT HOLDING DEVICE

Kawazoe Michio, 5-30-11, Narita Hihashi, Tokyo, Japan

Filed May 16, 1977, Ser. No. 796,986
Claims priority, application Japan, Jan. 29, 1977, 52/9609[U]
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—316 E 7 Claims

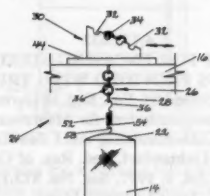


1. An object holding device for removably attaching a main object to an accessory object where either the main object or the accessory object has a pillar-shaped portion comprising: an annular clamping band being put on the pillar-shaped portion of one of the two objects; a holder having one end which is joined with the other object and the other end which is pushed against the pillar-shaped portion through the annular clamping band, the one end of the holder having a cylindrical hollow with a bottom, a centerhole of the bottom being made through the bottom, a surface of the bottom having one or plural convex planes, one or plural concave planes, and one or plura inclined planes which are arranged in a given order; a disk which is put rotatably in the cylindrical hollow, the disk having an operating lever, a surface of the disk having one or plural convex planes, one or plural concave planes, and one or plural inclined planes which are arranged in such a manner that the surface of the disk engages the surface of the bottom; and a headed connecting bolt having a screw head brought into contact with the disk and having a shank passing through the disk and the holder, the end of said shank being joined with the annular clamping band.

4,123,027
ADJUSTABLE TENSIONING AND RETAINING DEVICE

Robert G. Huntington, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.

Filed Jan. 7, 1977, Ser. No. 757,575
Int. Cl.[2] F16M *11/04*
U.S. Cl. 248—327 8 Claims



1. An adjustable tensioning and retaining device for holding fast a filter bag in a baghouse apparatus, the adjustable tensioning and retaining device comprising:

an elongated linking member adapted to be connected to the filter bag;

a body member having a plurality of spaced indentations, the body member is wedge shaped with a sloping top surface and the indentations are formed in the sloping top surface;

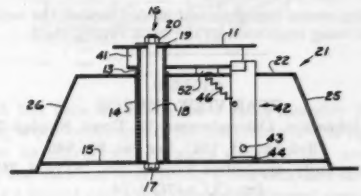
means for mounting the body member to a supporting member for linear movement of the body member along the supporting member so that the plane of the sloping top surface of the body member containing the indentations is inclined to the direction of linear movement of the body member; and,

coupling means for removably connecting the linking member into any one of the indentations of the body member.

4,123,028
SWIVEL SEAT PEDESTAL

Howard M. Quakenbush, Apple River, Ill., assignor to Flexsteel Industries, Inc., Dubuque, Iowa

Filed Aug. 6, 1975, Ser. No. 602,204
The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—425 9 Claims



1. In a swivel pedestal for a vehicle seat, a mounting plate adapted to be secured to the underside of the seat, a shaft rigidly secured to and depending from said plate, a base member adapted to be rigidly secured to a floor portion of the vehicle, a tubular member rigidly secured to and upstanding from said base member to receive and journal said shaft for rotation about a vertical axis, a brace plate secured to said shaft and said mounting plate and including a horizontal portion in spaced relation below said mounting plate, a generally vertically extending lock bar mounted on said base member and having a portion of generally V-shaped cross-section with the apex of said portion pointing toward said vertical axis, and spring means acting on said lock bar to urge said portion toward said vertical axis and toward engagement with the periphery of said portion of said brace plate, said brace plate having a peripheral cam edge portion engagable with said lock bar portion during rotation of said shaft through a predetermined angle and of gradually increasing radial distance from said axis to cam said lock bar portion radially outwardly against the action of said spring means and having a radially inwardly extending generally V-shaped notch at the large radius end of said cam edge portion to receive said lock bar portion to lock said shaft in said mounting plate in a certain angular position.

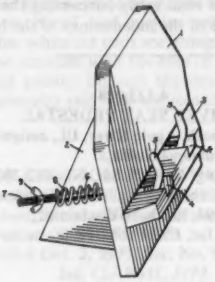
4,123,029
BOOK HOLDER

Michael A. Gillotti, 11600 Barnett Valley Rd., Sebastopol, Calif. 95472

Filed Apr. 28, 1977, Ser. No. 791,990
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—453 4 Claims

4. A book holder for holding a book in an open, upright position comprised of a face plate held in a rearwardly inclined position by a support plate mounted on the back side of said face plate, a book resting shelf mounted on the front side of said face plate and horizontally perpendicular to said face plate, a pair of spring biased, page gripping assemblies mounted at the level of the book resting shelf for releasable engagement of the lower edges of a book's leaves, each page gripping assembly comprising a rod extending through an

opening in the face plate, said shelf comprising a guide channel aligned with each opening and said page gripping assembly



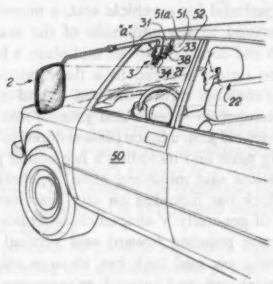
comprising means engaging said guide channel, the weight of the book being supported by the book resting shelf.

4,123,030

REAR VIEW MIRROR

Nils G. Johansson, Ostrandsvagen 30, Timrä, Sweden (86100)

Filed Jun. 15, 1977, Ser. No. 806,940
Claims priority, application Sweden, Jun. 16, 1976, 7608123
Int. Cl.[2] A47G *1/24*
U.S. Cl. 248—478 **2 Claims**



1. A rear-view-mirror arrangement which can be detachably mounted to the window of a vehicle, said arrangement comprising an arm, on one end of which there is arranged a device for holding a mirror and on the other end of which there is arranged means for detachably mounting said arrangement to said window including a U-shaped member having limbs, whose distance apart is equal to or slightly greater than the thickness of said window, the outwardly facing limb of said attachment device carrying a sleeve arranged to co-act with said arm so as to permit rotation of said arm in said sleeve, wherein

(a) said arm at said attachment device is provided with a curved portion whose angle of curvature is less than 80° and more than 45° so that it is locatable at the edge of or externally of the area of vision of the driver of said vehicle to said mirror;

(b) said other end of said arm having a threaded portion, with which a corresponding nut cooperates;

(c) a spring loosely surrounding said other end of said arm and biasing the lower surface of said sleeve and the upper surface of said nut apart; and,

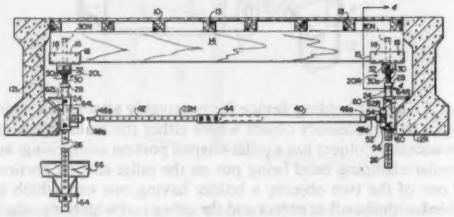
(d) a pin affixed to said other end of said arm a predetermined axial distance from said threaded portion said pin bearing against the upper surface of said sleeve and compressing said sleeve against said spring, the upper surface of said sleeve having grooves which cooperate with said pin to thereby permit said mirror to be adjusted to anyone of a number of predetermined positions, and in that the arrangement of said arm is such that when said arm is subjected to a pressure exceeding a pre-determined value said pin will no longer co-act with said groove thereby enabling the arm to rotate relative to said sleeve.

4,123,031

CONCRETE ROADWAY-SLAB FORMING AND FORM-ELEVATION ADJUSTING MEANS

Robert W. Hyre, P.O. Box 7082, Chattanooga, Tenn. 37410

Continuation-in-part of Ser. No. 723,136, Sep. 14, 1976, abandoned. This application Jun. 1, 1977, Ser. No. 802,564
Int. Cl.[2] E01D *1/00*
U.S. Cl. 249—24 **7 Claims**



1. In concrete roadway slab-forming and form-elevation adjusting means, wherein said means comprises generally planar decking adapted to extend between and to be disposed flush with the top-most horizontal surfaces of a spaced-apart in-place pair of girders provided with oppositely facing foot flanges, a plurality of longitudinally extending, spaced-apart joists on which said decking is lair, purlins extending transversely between upper portions of said girders providing support for said joists and decking, said purlins being supported adjacent their ends in upwardly opening U-members, a pair of adjustable length generally vertical rodform support members supporting said U-members and adapted to extend between said facing foot flanges of the girders and said U-members, and adjustable means extending transversely between and supporting the lower end-length portions of said rod-form support members and adapted to be forcefully held to said oppositely facing foot flanges, the improvement comprising said purlins being disposed in laterally spaced-apart pairs in said U-members, and each said rod-form support member extending upwardly into the space between the pairs of purlins and terminating in means enabling bodily adjustment of the elevation of said purlins, joists and decking from above said decking.

4,123,032

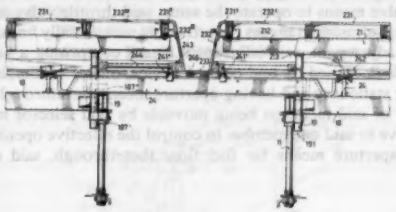
ARRANGEMENT FOR ENCASING STEEL CONCRETE CEILINGS PROVIDED WITH TRUSSES

Horst Teschner, Lichtendorf, Fed. Rep. of Germany, assignor to Ingenium Ingenieurgesellschaft für Mehrzweckbauten, Industrieanlagen und Geländenutzung mbH Bau-Kommanditgesellschaft, Schwerte-Lichtendorf, Fed. Rep. of Germany

Filed Jul. 5, 1977, Ser. No. 813,100
Int. Cl.[2] E04G *11/46*
U.S. Cl. 249—29 **11 Claims**

1. A portable casing table arrangement for encasing ceilings with trusses, comprising: a framework of four telescopic supports and strengthened by struts; casing beams held by said framework; telescopic ceiling casing carriers located on two sides of said casing beams; means on said framework for supporting the casing for the trusses, beam support carriers between said casing beams and said supports and being telescoped on both ends and combined into a fixed-angle frame detachably and tension-proof connected to said supports; truss casing carriers on the beam support carriers having abutments and adapted to bridge a space between adjacent casing table arrangements; for the truss casing said abutments being mov-

able on said truss casing carriers; four intermediate supports detachably fastened to said beam support carriers; said casing



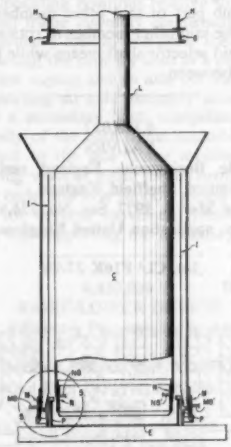
beams supporting said ceiling casing carriers and being combined with said ceiling casing carriers into a rigid-angle frame and being fastened to said four intermediate supports.

4,123,033

APPARATUS FOR FORMING HOLLOW CYLINDRICAL PIPES OF REINFORCED CONCRETE

Carl R. Joelson, P.O. Box 296, Venice, Fla. 33595

Filed Sep. 9, 1977, Ser. No. 831,967
Int. Cl.[2] B28B 7/18
U.S. Cl. 249—65 8 Claims



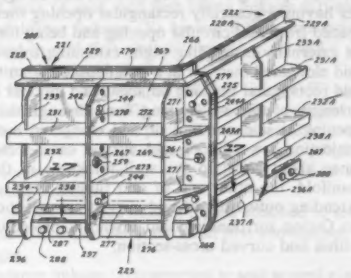
1. In the apparatus for forming a reinforced concrete pipe in a vertical position comprising a removable inner form, a removable outer form and a support for the lower end of said pipe, a sealing assembly for the lower end portion of each of said forms comprising a depending seal plate assembly attached to and extending along one surface of the lower end portion of each of said forms in a continuous manner, said one form surface being opposite the surface of each form which will be in contact with a forming pipe, a flexible and continuous sealing member attached to each seal plate assembly and forming a chamber between said seal plate assembly and said flexible sealing member and means to cause said flexible member to be extended into contact with each said support upon which the pipe is to be formed and to be withdrawn from such contact with said support.

4,123,034

BOX FORM FOR CONCRETE CULVERT

Elmer Kenneth Crunk, and John W. Craft, both of Jonesboro, Ark., assignors to BC Pausch, Inc., Jonesboro, Ark.

Continuation-in-part of Ser. No. 743,789, Nov. 22, 1976, abandoned. This application Feb. 14, 1977, Ser. No. 768,029
Int. Cl.[2] B28B 7/00
U.S. Cl. 249—156 42 Claims



1. A box form mountable on a pallet assembly for use in making a box concrete culvert comprising: a first right angle section having upright normally disposed first and second walls, and said first wall having a first end, said second wall having a second end, a first outwardly directed upright flange secured to the first end, a second outwardly directed upright flange secured to the second end, a second right angle section having upright normally disposed first and second walls, said first wall of the second right angle section having a third end, said second wall of the second right angle section having a fourth end, a third outwardly directed upright flange secured to the third end, a fourth outwardly directed upright flange secured to the fourth end, reinforcing members secured to said first and second walls of the first and second right angle sections, a first corner unit having first and second normally disposed upright flanges located adjacent the first and fourth flanges, first studs secured to the first and fourth flanges, said first and second flanges of the first corner unit having holes accommodating said first studs to locate the first corner unit on the first and second sections, said flanges of the first corner unit and first and fourth flanges having first aligned holes, first releasable fastening means extended through said first aligned holes to secure the first corner unit to the first and second sections, a second corner unit, having first and second normally disposed upright flanges located adjacent the second and third flanges of the first and second sections, second studs secured to the second and third flanges, said first and second flanges of the second corner unit having holes accommodating the second studs to locate the second corner unit on the first and second sections, said first and second flanges of the second corner unit and said second and third flanges of the first and second sections having second aligned holes, second releasable fastening means extend through the second aligned holes to secure the second corner unit to the first and second sections, and rail means secured to lower portions of the first and second sections below and laterally outward from said first walls and second walls for locating the box form on a pallet assembly.

4,123,035

CONDUIT COUPLING MEANS FOR MILKING SYSTEMS AND METHOD OF MAKING SAME

Archie E. Boudreau, P.O. Box 1125, Modesto, Calif. 95353

Continuation-in-part of Ser. No. 850,665, Nov. 11, 1977, abandoned, which is a continuation of Ser. No. 764,805, Feb. 2, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 881,246
Int. Cl.[2] F16L 41/00
U.S. Cl. 251—146 17 Claims

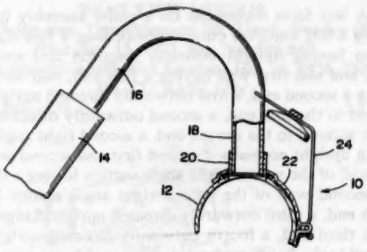
1. In a milking system comprising a tubular manifold having an opening through the wall thereof, a connector body

adapted for connecting a milking hose to said manifold adapted to be matingly fitted through said opening in said manifold and clamp means for mounting said connector body on said manifold, the improvement wherein said connector body comprises:

a. an elongated member of flat steel stock formed to provide a curved cross-section dimensioned to conform to the external periphery of said tubular manifold and having a circular opening at one end thereof, said elongated member having a generally rectangular opening therethrough spaced from said circular opening and being formed with an externally protruding bight extending transversely of said elongated member at a point spaced from the end of said rectangular opening adjacent said circular opening;

b. a length of thin wall tubing fixed through said circular opening at said one end of said elongated member and projecting inwardly of said curved cross-section a distance about equal to the wall thickness of the tubular manifold, the other end of said tubular connector body extending outwardly of said curved cross-section;

c. an O-ring surrounding said inwardly projecting tubing within said curved cross-section;



d. tongue means extending longitudinally with respect to said rectangular opening, said tongue means being made integral with said elongated member adjacent said one end of said rectangular opening with the free end of said tongue means adjacent said bight;

e. a generally "L" shaped closure arm made of flat stock steel, said closure arm having transverse dimensions adapted to be received in said rectangular opening, one leg of said closure arm being adapted to selectively close the outwardly projecting end of said tubing and the end of the other leg of said closure arm being provided with hinge means and having a lip extending in a direction generally parallel to said one leg adapted to engage said free end of said tongue in use; and

f. a pin through said bight in said elongated member, said hinge means of said closure arm being engaged with said pin and said lip of said closure arm being engaged with said free end of said tongue to cause said one leg of said closure arm to resiliently close said externally projecting end of said tubing.

4,123,036

FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

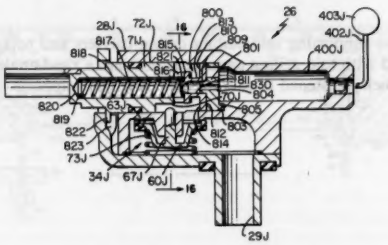
Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 570,864, Apr. 23, 1975, Pat. No. 4,007,907, which is a division of Ser. No. 530,605, Dec. 9, 1974, Pat. No. 3,989,064, which is a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, Jul. 18, 1973, abandoned. This application Nov. 18, 1976, Ser. No. 742,847

Int. Cl.[2] F16K *25/00*; F23N *1/00*

U.S. Cl. 251—180 **4 Claims**

1. A fuel control device having passage defining means for interconnecting a fuel source with a main burner means, said control device having a rotatable selector shaft means, said control having throttle valve means for throttling fuel flow through said passage defining means to said burner means, said selector means being operatively interconnected to said throttle valve means to operate the same, said throttle valve means having adjustment means for providing substantially linear fuel flow adjustment, said adjustment means comprising a pair of members carried by said control device, one of said members being stationary and having aperture means therethrough, the other of said members being movable by said selector means relative to said one member to control the effective opening of said aperture means for fuel flow therethrough, said other



member being rotatable relative to said one member, said other member being rotatably mounted on said one member, said one member having a central hub part extending from one side thereof, said other member having a central hub part thereof telescopically receiving said hub part of said one member to rotatably mount said other member thereon, said hub part of said other member having spline means thereon, said selector shaft means having spline means interconnected to said spline means of said hub part of said other member whereby said spline means cause said other member to rotate in unison with the rotation of said selector shaft means while permitting axial movement therebetween.

4,123,037

VALVES

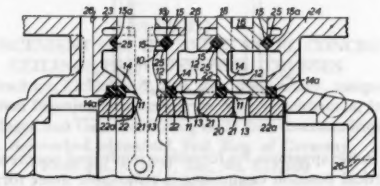
Peter J. Gillespie, Basingstoke, England, assignor to Bridon Engineering Limited, Sheffield, England

Filed Mar. 4, 1977, Ser. No. 774,614

Claims priority, application United Kingdom, Mar. 9, 1976, 9275/76

Int. Cl.[2] F16K *27/04*

U.S. Cl. 251—367 **7 Claims**

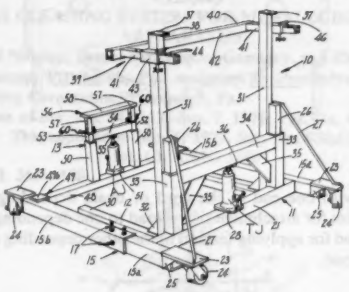


1. A valve comprising a valve housing containing a ported sleeve, the valve housing comprising a plurality of juxtaposed tubular housing members, each such member comprising a generally cup-shaped portion which is centrally apertured to accommodate the sleeve therethrough with a clearance therebetween, a plurality of relatively flexible leg members spaced about and extending axially from said aperture within said cup-shaped portion and a mounting ring carried on the free ends of said leg members arranged to surround and support the sleeve, seal means being located around said aperture and around the axially extending outer edge of the cup-shaped portion between each adjacent ones of said tubular members.

4,123,038
WHEEL LIFT

Gilbert D. Meyers, 2313 First Ave., Apt. 1334, Dodge City, Kans. 67801

Filed Jul. 15, 1977, Ser. No. 816,084
Int. Cl.[2] B66F 5/04
U.S. Cl. 254—2 R 9 Claims

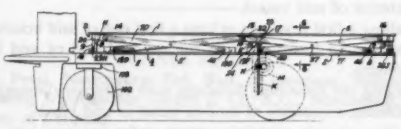


1. A wheel lift apparatus for lifting and supporting wheel-mounted vehicle tires as a primary load, comprising a mobile base frame assembly including substantially parallel, longitudinal side frame members mounted on casters, a cross frame member rigidly interconnecting said side frame members adjacent one end thereof, said side and cross frame members forming a horizontal portion of said base frame assembly, and vertical guide means projecting upwardly from said horizontal portion; a lift frame assembly adapted for limited vertical movement between lower primary load orienting and upper primary load supporting positions relative to said base frame assembly, said lift frame assembly comprising first means for contacting the primary load in one plane thereof, and second means for contacting the primary load in a plane substantially normal to the first means; and an axle lift frame assembly for lifting and supporting an axle assembly associated with the vehicle tires as a secondary load, comprising a cross beam extending laterally of the base frame assembly and being removably attached to the side frame members thereof, said cross beam having vertical guide means projecting upwardly intermediate its ends, and axle support means including a jack frame adapted for vertical movement relative to the cross beam for lifting and supporting the secondary load.

4,123,039
RAISE-LOWER DEVICE

Satinder K. Vig, Edinboro, Pa., assignor to American Sterilizer Company, Erie, Pa.

Continuation of Ser. No. 593,002, Jul. 3, 1975, abandoned. This application Dec. 28, 1976, Ser. No. 754,937
Int. Cl.[2] B66B 11/04
U.S. Cl. 254—9 C 4 Claims



1. In combination, a vehicle frame (A) and a lifting mechanism and a platform,

said lifting mechanism comprising,

a first plate-like member (2), and

a second plate-like member (2'),

said plate-like members being disposed in a common plane in end to end relation to each other and resting on said frame (A),

said lifting mechanism comprising a first lifting linkage (D) and a second lifting linkage (E), a third lifting linkage (F) and a fourth lifting linkage (G),

each said lifting linkage being made up of first links (7D, 7E, 7F and 7G) and second links (3, 4, 5 and 6), attached to said frame and to said plate-like member,

each said first links being pivoted to a said second link adjacent their mid-points (37D, 37E, 37F and 37G) to swing relative to each other,

the said links of each said first lifting linkage (D) and said second lifting linkage (E) having a first end swingably attached to said first plate-like member (2) and a second end supporting said platform (1),

the said links of each said third lifting linkage (F) and said fourth lifting linkage (G) having their first ends swingably attached to said second plate-like member (2'),

first front balance linkage means attached to said first plate-like member and connected to said first (D) and second (E) lifting linkages,

an intermediate balance linkage means attached to said second plate-like member and to said first and second, lifting linkages,

a rear balance linkage (J) connected to said second plate-like member and connecting said third (F) and fourth (G) lifting linkages to said second plate-like member (2'),

a front connecting rod (14),

an intermediate connecting rod (15) and a rear connecting rod (16),

means connecting the ends of said front connecting rod (14) to said first balance linkage means (H) and to the second ends of said first links (3 and 4) of said first lifting linkages (D and E), holding said second end of said first links of said first lifting linkage and said second lifting linkage in fixed, spaced relation to each other,

means connecting said intermediate connecting rod (15) to said intermediate balance linkage means (I) and to the second ends of the second links (5 and 6) of said first and second lifting linkages and to the second ends of the second links of said third lifting linkage and said fourth lifting linkage,

and means connecting said rear connecting rod (16) to said rear balance linkage means (J) and to second ends of said first links (7F and 7G) of said third lifting linkage (F) and said fourth lifting linkage (G), holding said third lifting linkage and said fourth lifting linkage in fixed spaced relation to each other,

lifting linkage means comprising,

a lifting bar (35') having its end (35) fixed to said second end of said second links (5 and 6) of said third balance linkage means (F) and said fourth balance linkage means (G),

said lifting means being supported on said frame and connected to the center of said lifting bar (35') for lifting said platform relative to said frame.

4,123,040
WINCH MOUNTING APPARATUS

Encho J. Kuzarov, Milwaukie, Oreg., assignor to Warn Industries, Inc., Kent, Wash.

Continuation of Ser. No. 615,847, Sep. 23, 1975, abandoned. This application Apr. 1, 1977, Ser. No. 783,640
Int. Cl.[2] B66D 3/00
U.S. Cl. 254—166 6 Claims

1. An improved, bumper-mounted winch assembly of the type having:

(a) a base structure, such as an automobile bumper bracket, to which the winch is mounted;

(b) a rotatable drum for winding a cable;

(c) a drive housing containing a drive assembly for said drum and supporting the driven end portion of said drum; and

(d) an idler housing fastened to the base structure and supporting the opposite, idler end portion of said drum, wherein the improvement comprises:

(e) an angularly variable drive housing mounting means in

line contact with said base structure, which connects said drive housing to said base structure and which permits limited angular movement of said drive housing relative to the base structure about a mounting axis, provided by such line contact, which is generally parallel to the base structure, wherein said angularly variable drive housing mounting means comprises a plurality of attachments aligned along said line contact mounting axis wherein:

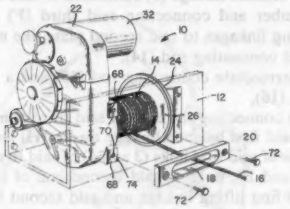
(i) each attachment comprises solely a fastener and a pair of contact surfaces;

(ii) one contact surface of each said pair is a part of said drive housing and the other contact surface of each said pair is a corresponding part of said base structure;

(iii) at least one contact surface of each pair of contact surfaces is a convex protrusion;

(iv) each pair of contact surfaces is held in contact by means of said fastener; and

(v) each said fastener extends completely through said base structure in an axial direction substantially perpendicular to said base structure and through said contact surfaces; whereby under conditions of distortion and misalignment of said base structure rolling contact can



occur between each pair of contact surfaces, the line of contact therebetween moving laterally across said base structure in a direction substantially parallel to said base structure; and

(f) mounting means for said idler end portion of said drum comprising sleeve bearing means stationary with respect to said idler housing and characterized by a relatively large diameter as compared to its axial length to provide both adequate bearing support and to permit angular motion of said idler end portion of the drum with respect to said idler housing by allowing said idler end portion to tip within said idler housing under conditions of base structure distortion and misalignment; whereby under circumstances of said base structure misalignment and distortion said angularly variable drive housing mounting means and said mounting means for said idler end portion of the drum are capable of properly compensating for said misalignment and distortion of the base structure to maintain said drum in a proper angular relationship with respect to the drive housing for proper operation of the drive components of the winch without binding, while simultaneously transmitting loads from drum to said base structure.

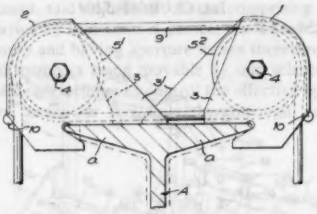
4,123,041

LIFTING TACKLE

Arthur H. Bucknall, Ventnor Cottage, Sough Rd., Darwen, Lancaster, England

Filed Jul. 12, 1977, Ser. No. 815,022
Int. Cl.[2] B66D *3/08*
U.S. Cl. 254—195 **2 Claims**

1. A lifting tackle for raising a load into contact with the underside of a flanged I section girder or beam comprising pairs of brackets adapted to be mounted in laterally opposed relation on the upper flange of the girder or beam, side cheeks on each bracket recessed to form a V notch, the upper surface of each notch being substantially horizontal to grip the upper surface of the upper flange of the girder or beam, a spindle passing through the cheeks of each bracket and pulleys mounted on each spindle, one side cheek of each bracket being extended forwardly of the other cheek to allow the brackets of each pair to nest together laterally on assembly on small girders, and a cord or chain passing over the pulleys on the pair of



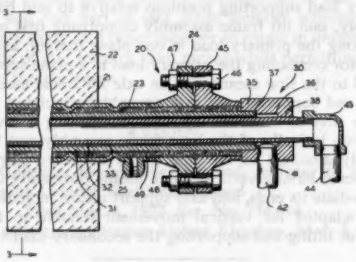
brackets with one end of the cord or chain depending from each bracket for attachment of the load to one depending cord or chain and for applying tension to the other depending end to raise the load.

4,123,042

STEEL CONVERTER VESSEL TUYERE BLOCK CONSTRUCTION

Jai K. Pearce, Pittsburgh, Pa., and William Wells, Sydney, Canada, assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Division of Ser. No. 369,820, Jun. 14, 1973, Pat. No. 4,036,481.
This application Feb. 10, 1977, Ser. No. 767,465
Int. Cl.[2] C21C *5/48*
U.S. Cl. 266—44 **4 Claims**



1. The method comprising the steps of:

casting a plurality of tubular tuyere housings in separate blocks of refractory material with one end of each said housing extending from the end of its associated block,

installing said plurality of blocks in the lower level of a refractory lined metallurgical vessel with said tuyere housings extending generally toward the interior thereof and the one end of said housings being exposed on the exterior of said vessel,

installing a first tuyere in at least a first one of said housings,

securing said first tuyere to the exposed end of said first housing,

plugging the remaining housings with refractory material,

containing a quantity of molten metal in said vessel,

injecting oxygen containing gases under pressure into said vessel through said tuyere and beneath the level of said metal causing said tuyere to burn down to a predetermined length,

removing said burned down tuyere from said first housing,

plugging the housing from which said burned tuyere was removed by inserting refractory material through the exposed end thereof,

opening a second one of said housings,

installing a second tuyere in said opened housing,

securing said second tuyere to the exposed end of said second housing, and

placing refractory around the inner end of said second tuyere so that the refractory lining of the vessel in the area surrounding said second tuyere has substantially its initial thickness.

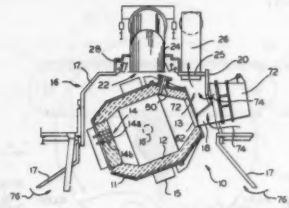
4,123,043
GAS CLEANING SYSTEM FOR METALLURGICAL APPARATUS

Harold Nomine, Essen, Fed. Rep. of Germany, and Eberhard G. , Schempp, Pittsburgh, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Division of Ser. No. 647,112, Jan. 7, 1976, Pat. No. 4,081,269. This application Sep. 6, 1977, Ser. No. 830,614

Int. Cl.² C21C *5/40*

U.S. Cl. 266—158 **10 Claims**



1. A metallurgical system comprising first and second metallurgical vessels each having tuyere means for injecting process fluids beneath the level of metal contained with each vessel and each having an opening formed therein through which exhaust gases discharge,

first and second enclosure means respectively surrounding at least the upper portions of said first and second vessels, first and second primary gas collecting means extending respectively through each enclosure and positioned to collect gases discharging from its associated vessel when the latter is in a normal process position,

an access opening formed in each enclosure and closure door means for selectively opening and closing said access opening,

said vessels being tiltable about generally horizontal axes for movement from a normal operating position and toward said access openings whereby said vessels may receive a metallic charge,

first and second secondary hood means coupled respectively, to said first and second enclosures,

first and second gas cleaning systems respectively connected to said first and second primary hood means and each including means for removing particulate from the exhaust gases and gas flow producing means,

and selectively operable coupling means for selectively coupling said first secondary hood means to said first or second gas cleaning systems and said second secondary hood means to said first or second gas cleaning systems.

4,123,044
TUNNEL FURNACE

Fritz Petzi, Nuremburg, Fed. Rep. of Germany, assignor to Ludwig Riedhammer GmbH & Co. K.G., Nuremburg, Fed. Rep. of Germany

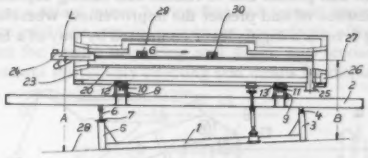
Filed Jul. 11, 1977, Ser. No. 814,400

Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720630

Int. Cl.² F27B *9/14*

U.S. Cl. 266—255 **1 Claim**

1. In a sintering kiln for metal ceramics being inclined along its longitudinal axis and mounted for swinging movement in the transverse direction and incorporating: a lower muffle (**20**), an upper removable trough ceiling (**21**) connected to the lower muffle, a chassis (**1**), a box frame (**2**) mounted in inclined position on the chassis (**1**), transverse struts (**10, 11**) pivotally mounted in the manner of a balance beam on the box frame (**2**), a hydraulic cylinder (**16**) and piston rod (**18**) associated therewith, the piston rod (**18**) being hingedly connected to a free



end of the transverse strut (**11**), the hydraulic cylinder (**16**) being hingedly connected to the support chassis, burners (**29, 30**) and gas infeed pipes (**31**) being mounted laterally along the longitudinal extent of the kiln.

4,123,045
CRUCIBLE FOR INDUCTION HEATING APPARATUS

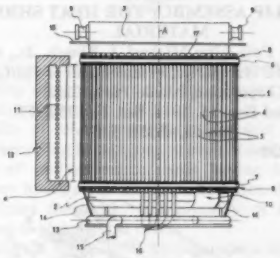
Jacques Michelet, Metz, and Hugues Zanetta, St-Julien-les-Metz, both of France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Oct. 4, 1977, Ser. No. 839,317

Claims priority, application France, Oct. 4, 1976, 76 29996

Int. Cl.² F27B *14/06*

U.S. Cl. 266—275 **10 Claims**



1. A crucible having an internal refractory line maintained by a metallic structure consisting of:

a base pan;

a collar spaced above said base pan;

respective lower and upper mounting rings secured to said base pan and said collar;

an annular array of non-round-section tierods extending vertically between said rings and having angularly juxtaposed sides defining spaces of outwardly decreasing angular width;

means for securing said rods to said rings and

wedge-shaped blocks of refractory and electrically insulating material tightly fitting between said sides of said rods and of outwardly decreasing angular width, whereby outward pressure on said blocks wedges same tightly between said rods.

4,123,046
DEVICE FOR SECURING A MIXING CAPSULE FOR DENTAL PREPARATIONS

Bruno A. Madlener, Feldkirch-Tosters, Austria, assignor to Etablissement Dentaire Ivoclar, Schaan, Liechtenstein

Filed Jun. 28, 1977, Ser. No. 810,813

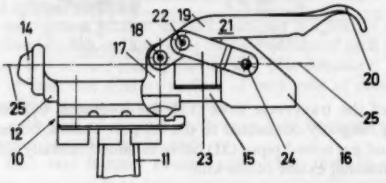
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630376

Int. Cl.² B25B *5/14*

U.S. Cl. 269—228 **11 Claims**

1. In a device for securing a mixing capsule for dental preparations to the support of a vibrating machine for mixing the

components of said dental preparations, said support being provided with an abutment and a presser adjustable by an operating lever pivoted to said support, said abutment and said presser being adapted to secure said mixing capsule in a first position of said presser and to release said mixing capsule in a second position of said presser the improvement wherein said operating lever is a toggle lever connected by way of a link to



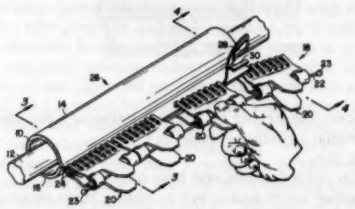
the presser such that when said toggle lever is moved to dispose said presser from said second position to said first position the link pivot point on said toggle overshoots a dead center position, said presser being axially movable in a reciprocating manner and in relation to the abutment from its second position to its first position and vice versa, the central thrust line of the apparatus being coincident with the central axis of a capsule to be disposed therein.

4,123,047

MODULAR CLIP ASSEMBLY FOR HEAT SHRINKABLE MATERIAL

Lowell I. Koht, Palo Alto; Michael J. Kinsch, Jr., Sunnyvale, and William H. Humphries, Freemont, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 15, 1976, Ser. No. 750,977
Int. Cl.² B25B *5/14*
U.S. Cl. 269—238 **16 Claims**



1. A modular clip assembly for clamping laid-together portions of cross-linked, dimensionally heat unstable polymeric material along a to-be-formed bond line during the application of heat from an external heat source to form a bond between clamped portions of said material comprising:

a first manually operable clip module possessing first and second parallel jaws formed with a pair of cooperating plates, each of said cooperating plates possessing a terminal portion disposed inwardly to form a pair of continuous bond line gripping flanges, each continuous gripping flange and associated plate having a generally L-shaped cross-sectional configuration, the short arms of the L's which correspond to said continuous gripping flanges being substantially colinear when said jaws are closed, the portions of said plates corresponding to the long arms of the L's being provided with a plurality of ventilating apertures adjacent said continuous gripping flanges, first and second handles connected respectively to said first and second jaws, hinge means for allowing said jaws to move cooperatively into and out of engagement with each other in longitudinally parallel relationship, and spring means for urging said jaws into mutual engagement;

a second manually operable clip module possessing elements corresponding to those of said first manually operable clip module; and

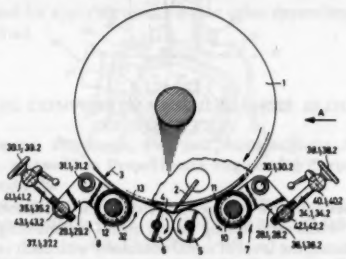
flexible linking means interconnecting said first and second clip modules for maintaining a selected longitudinal relationship between said modules thereby facilitating the hand installation of said modular clip assembly along said to-be-formed bond line.

4,123,048

GEAR FOLDER

Otto T. Weschenfelder, Wurzburg, and Horst B. Michalik, Hochberg, both of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Jul. 8, 1977, Ser. No. 814,071
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634108
Int. Cl.² B65H *45/16*
U.S. Cl. 270—77 **6 Claims**



1. A gear folder for folding precut ribbon segments, said gear folder including a gear folding cylinder rotatable at a first speed in a first direction about a longitudinal axis and having at least one folding blade, and at least one pair of folding rollers for folding said ribbon segments inserted between said pair of folding rollers by said folding blade, said gear folder further including ribbon tensioning means to tension said ribbon segments against said folding cylinder, said ribbon tensioning means comprising:

a first rotating pressure means exerting pressure against said folding cylinder and being positioned in front of said pair of folding rolls in said first direction of rotation of said folding cylinder and extending generally parallel to said longitudinal axis of said folding cylinder;

a second rotating pressure means exerting pressure against said folding cylinder and being positioned behind said pair of folding rolls in said first direction of rotation of said folding cylinder and extending generally parallel to said longitudinal axis of said folding cylinder;

means for rotating said first and second pressure means in a second direction opposite to said first direction of rotation of said folding cylinder and at speeds different from each other and from said first speed of rotation of said folding cylinder; and

means for adjusting said pressure exerted by said first and second rotating pressure means against said folding cylinder whereby said ribbon segments are tensioned against said folding cylinder by said first and second rotating pressure means.

4,123,049

PRINTING PLATE TRANSFER APPARATUS

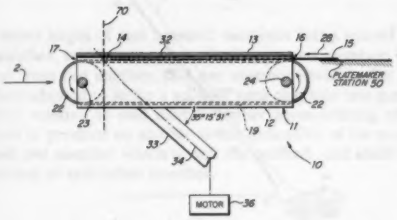
Robert D. Jacobs, Geneseo, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Mar. 4, 1977, Ser. No. 774,301
Int. Cl.² B65H *5/02, 5/18, 9/00*
U.S. Cl. 271—225 **13 Claims**

1. In a transfer apparatus for receiving an object from a first station and for transferring said object to a second station,

wherein said objects enters said transfer apparatus from said first station moving in a first direction along an input plane and wherein said object leaves said transfer apparatus to said second station moving in a second direction along an output plane different from said first direction and said input plane, said transfer apparatus comprising:

A. receptor means for receiving said object, said receptor means having an input end wherein said object enters said receptor means and an output end opposite said input end wherein said object leaves said receptor means, and wherein said receptor means includes means for defining a substantially planar support surface for supporting said object, said receptor means being movable from a first position aligned with said input plane for receiving said object entering from said first station, to a second position aligned with said output plane for outputting said object to said second station; and



B. drives means for moving said receptor means from said first position to said second position, said drive means including:

a. shaft means having a shaft axis coupled to and supporting said receptor means, said shaft means being coupled to said receptor means with reference to a center line extending from said input end to said output end such that said axis intersects said substantially planar support surface at said center line with said axis oriented at a first acute angle relative to said center line, and at a second acute angle relative to said substantially planar support surface, and

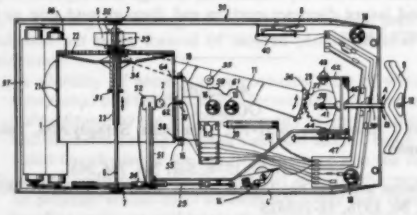
b. means for rotating said shaft means about its axis, rotation of said shaft means moving said receptor means from said first position to said second position.

4,123,050

TOY AIRCRAFT FLIGHT SIMULATOR

Fernando Casado, San Sebastian, Spain, assignor to Bianchi, S.A., San Sebastian, Spain

Filed Oct. 8, 1976, Ser. No. 730,917
Claims priority, application Spain, Oct. 8, 1975, 215.694
Int. Cl.² G09B 9/08; A63G 31/16
U.S. Cl. 273—1 E **14 Claims**



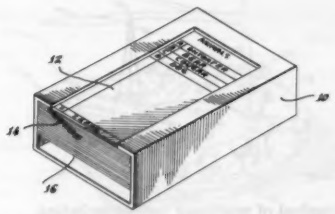
1. A toy aircraft flight simulator comprising a display screen, a rotating drum, the periphery of said rotating drum being a translucent screen having an aerial landscape image depicted thereon, means for rotating said drum, a light source with said drum, means for displacing said light source within said drum so as to vary the distance from said light source to said periphery of said drum, said light source projecting said aerial image upon said display screen and said image being altered in size as said light source is displaced within said drum, means for axially displacing said drum, and unitary control means, said unitary control means having first and second control movements, said first control movement operatively effecting said means for axially displacing said drum, said second control movement operatively effecting said means for displacing said light source within said drum.

4,123,051

EDUCATIONAL GAME

Hedwig R. Tsacoyannis, 110 E. End Ave., New York, N.Y. 10028

Filed Jul. 28, 1977, Ser. No. 819,953
Int. Cl.² A63F 9/00
U.S. Cl. 273—1 R **6 Claims**



1. An educational game comprising in combination:

a plurality of category cards each having indicia thereon defining a category of items;

a plurality of reference cards, one of said reference cards corresponding in category to each of said category cards, each of said reference cards having indicia disposed thereon listing a plurality of items disposed in the category associated therewith, said plurality of items being arranged in alphabetical order;

a plurality of score cards having indicia disposed thereon dividing said score cards to facilitate the writing of items thereon;

a plurality of markers each having a letter of the alphabet disposed thereon; and

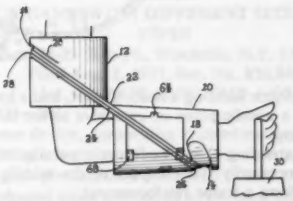
means for timing a preselected interval of time.

4,123,052

TOY OR GAME

John A. Perkins, Portage, Mich., assignor to Perky & Me Co., Battle Creek, Mich.

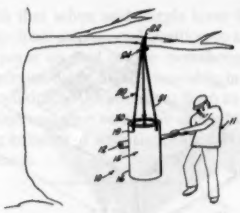
Filed Feb. 28, 1977, Ser. No. 772,435
Int. Cl.² A63J 3/00
U.S. Cl. 272—8 N **19 Claims**



1. A device useful as a game or toy adapted to augment the muscle-power used in retracting the forearm, comprising a first sleeve adapted to embrace the forearm between the wrist and the elbow, first gripping means for causing said first sleeve snugly to embrace the forearm and to prevent it from slipping

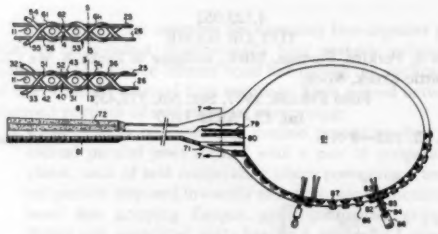
upwardly toward the elbow, a second sleeve adapted to embrace the upperarm between the elbow and the shoulder, second gripping means for causing said second sleeve snugly to embrace the upperarm and to prevent it from slipping downwardly toward said elbow, and first attaching means on said first sleeve and second attaching means on said second sleeve for attaching an elastic band to said sleeves with one end attached to the first attaching means and the other end attached to the second attaching means in a manner such that the elastic band is placed under tension by the extension of the forearm.

4,123,053
BATTING PRACTICE METHOD
Silvio D. Piccini, 13620 SW. 74th Ct., Miami, Fla. 33158
Division of Ser. No. 667,164, Mar. 15, 1976, Pat. No. 4,093,217.
This application May 25, 1977, Ser. No. 800,419
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 R **5 Claims**



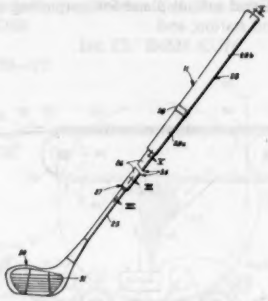
1. A method of practicing batting including,
- providing an open ended cylinder formed of an elastomeric material,
- slinging the cylinder from a support above the cylinder by usng at least three support members symmetrically spaced and attached atop the cylinder at one end and attached to the support on the other end,
- repetitive swinging of a bat by a batter against a strike area on the cylinder.

4,123,054
TENNIS RACKET FRAME
Jacqueline Septier, 9, rue Lentonnet, Paris, France (75009)
Filed Mar. 2, 1976, Ser. No. 663,066
Claims priority, application France, Mar. 4, 1975, 75 06736
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 F **9 Claims**



1. A racket frame forming a head, a heart, and a handle, said head defining a middle plane co-extensive to the striking surface, comprising:
- two strips extending along the frame in parallel relationship and symmetrically with respect to the middle plane, in order to form a frame reinforcement;
- at least one resin impregnated glass fiber string wound along said reinforcement and resting alternatively on one strip and on the other, in order to form a braiding encircling passage for netting strings; and
- said braiding comprising a first crossed braiding, a string passing from the internal edge of a strip to the external edge of the other strip and reciprocally, and a second braiding according to which a string passes from the external edge of a strip to the external edge of the other strip, then from the internal edge of said strip to the internal edge of the first strip, this pattern repeating itself along the reinforcement.

4,123,055
GOLF CLUBS
Harry M. Brill, 5818 N. Kostner, Chicago, Ill. 60629
Filed Jan. 3, 1977, Ser. No. 755,992
Int. Cl.[2] A63B *53/00, 53/12*
U.S. Cl. 273—77 A **27 Claims**



1. A golf club, comprising: a hollow shaft having a lower smaller diameter portion and an upper larger diameter portion with a step at a junction between the upper end of said smaller diameter portion and the lower end of said larger diameter portion, said larger diameter portion having a diameter of on the order of 0.5 inches and said smaller diameter portion having a diameter on the order of from 0.5 to 0.75 of that of said larger diameter portion, a grip secured on an upper end portion of said larger diameter portion of said shaft, and a head secured to a lower end portion of said smaller diameter portion and having a striking surface for impact with a golf ball to propel the ball a distance of at least on the order of 100 yards, said lower smaller diameter portion and said upper larger diameter portion being substantially uniform along their respective lengths, said step being located a substantial distance above said head to provide an exposed length of said smaller diameter portion between said head and said step, and said step being also located a substantial distance below the lower end of said grip to provide an exposed length of said upper diameter portion between said step and the lower end of said grip, transient forces developed during impact of said head with the ball and rebound following impact being rapidly transmitted through said exposed length of said smaller diameter portion to said step to develop at said step impact and rebound forces of short duration successively transmitted through said exposed length of said larger diameter portion and through said grip to the player's hands.

4,123,056
GOLFCLUB
Yoshiro Nakamatsu, 6-31-10,, Shimouma, Setagaya-ku, Tokyo, Japan
Filed Nov. 30, 1976, Ser. No. 746,263
Claims priority, application Japan, Jun. 26, 1976, 51-74990; Aug. 30, 1976, 51-102625
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—78 **4 Claims**

1. A golfclub comprising a club-head and a shaft, said club-head having two opposed members spaced from one another, each of said opposed members having longitudinal end portions with one end portion of one of said members being inte-

grally joined to one end portion of the other opposed member and the other end portion of said one member being spaced from the other end portion of the other opposed member, the distance between the end portions of said one member being substantially equal to the distance between the end portions of said other member, said opposed members each having an upper edge and a lower edge with each upper and lower edge extending between said end portions of the respective member,

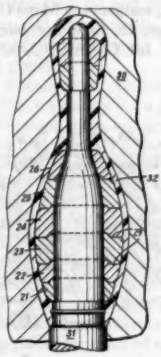
said upper edges of said opposed members being spaced from one another, said lower edges of said opposed members being spaced from one another, said one member having a flat striking face adapted to strike a golfball such that said one member vibrates relative to said other member upon striking of said golfball to produce an audible sound indicative of the position on said one member which struck the golfball, said shaft being connected to said other member.

4,123,057

MOLDED PLASTIC BOWLING PIN AND METHOD FOR THE MANUFACTURE THEREOF

George G. Murray, Jackson, N.J., assignor to The Strikemaster Manufacturing Corp., Washington, N.J.

Filed Jan. 6, 1977, Ser. No. 757,480
Int. Cl.[2] A63D *9/00*
U.S. Cl. 273—82 R **3 Claims**



1. A bowling pin having a base, side walls, belly, neck and head, said pin being formed of molded plastic material and comprising:

(a) a plurality of annular core elements each of which is constituted of a filled polymer formulation whose density is determined by the nature of quantity of the filler therein, said elements having varying sizes and shapes, being provided lengthwise of the pin from the base into the head;

(b) a shell constituted of a high impact strength thermoplastic polymer whose outer surfaces are softer than that of a bowling ball, are self-lubricating, and sound like wood upon impact by a bowling ball or another pin, said shell being formed integrally upon, being shrunk tightly about, and being firmly bonded to each of said elements, said shell having a substantially uniform thickness about said elements, defining the external configuration of the side walls, belly, neck and head of the pin, and providing a cavity adjacent to the base of the pin; and

(c) a bottom member defining the base of the pin and shaped to fit said cavity, said bottom member being capable of periodic replacement without impairing the pin;

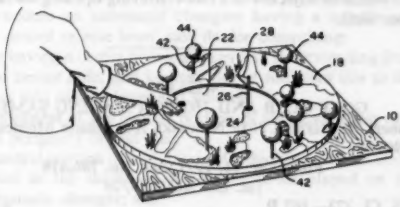
said pin having a composite structure possessing a weight distribution meeting the standards set by the American Bowling Congress.

4,123,058

GAME: DISK-GOLF

Robert C. Furyk, and Jon E. P. Gow, both of Barrie, Canada, assignors to Creative Inventions

Filed May 20, 1977, Ser. No. 798,776
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—87 H **8 Claims**



1. A game for simulating golf comprising:

a flat horizontal base;

a horizontal plate having a circular periphery, the top surface of said plate having an inner circular area which is recessed below the top surface and has an off-center small depression therein and an outer area which is annular in shape, said outer area being divided by radial lines into a plurality of sectors of like area, each sector having a top surface with roughened and smooth sections, said smooth sections communicating between the outer periphery and the inner periphery of said outer area; each sector having a different configuration of its top surface; and

means detachably securing said plate on top of said base in a manner at which said plate can be manually rotated about its center in either of clockwise and counterclockwise directions, while the base remains stationary, said means including a vertical shaft disposed at its bottom end in said base, the top end of the shaft being disposed in the center of the plate.

4,123,059

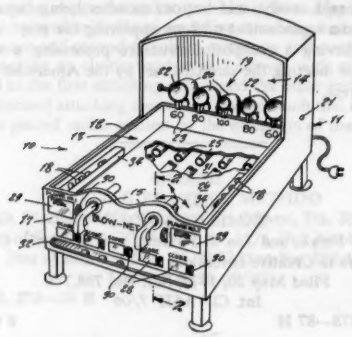
AIR GUN GAME WITH DIFFERENT SIZED TARGET PIPES

Mark Guibas, 28-25 56th Pl., Woodside, N.Y. 11377

Filed Aug. 1, 1977, Ser. No. 820,861
Int. Cl.[2] A63B *63/04*; F41B *1/00*
U.S. Cl. 273—101 **3 Claims**

1. A game device, comprising in combination, a housing on legs including a horizontal tray and a backstop, a pair of air-powered guns pivoted on a front wall of said tray, a plurality of elbow-shaped pipes pivoted in a row on a transverse rod in front of said back stop, each said pipe having an inlet, said inlets being of various sizes, each said pipe being numerically indicated with a scoring value according to a size of said inlet thereof, and a plurality of balls discharged from said guns toward said inlets; each said elbow pipe being connected by a

flexible rubber sleeve to a second pipe extending forwardly downwardly inclined through a counting mechanism and to a



ball rest area adjacent to a ball-retrieving opening on said tray front wall.

4,123,060

GOLF CLUB AND JIG FOR MAKING SAME

Robert H. Sterling, 3017 Nebraska Ave., Santa Monica, Calif. 90404

Filed Apr. 11, 1977, Ser. No. 786,416
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—167 R **8 Claims**

1. A head for a wood golf club having a front face, a rear portion, a sole surface, all being formed with a predetermined configuration, said head having a precisely located tooling hole therein for receiving a dowel pin so as to support the head in a predetermined precisely established position within exacting tolerances in a tooling jig during the fabrication of the head to permit finishing operations to be performed on the head so as to cause the head to conform exactly to a predetermined shape; and a jig for holding the head, said jig including a base having a hole therein precisely located at a predetermined position, a side wall extending perpendicular to the base at one side thereof, a pair of posts extending perpendicular to the base at the opposite side thereof and spaced from one another, and a clamp mounted on said side wall on the interior side thereof for holding the head firmly against the posts; and a dowel pin extending through the hole in the base to be received in the tooling hole in the head.

4. A method for manufacturing a head for a wood golf club having a sole surface and a front face, which method comprises: forming a precisely located index tooling hole in the head; clamping the head in a tooling jig; inserting a dowel pin through a hole in the base of the tooling jig and into the index tooling hole in the head to locate the head in the tooling jig at a desired orientation; and performing finishing operations on the head while held in the tooling jig to cause the head to conform exactly to a predetermined shape.

4,123,061

BALL AND PROCESS AND COMPOSITION OF MATTER FOR PRODUCTION THEREOF

Warren M. Dusbiber, Plymouth, Mich., assignor to Acushnet Company, New Bedford, Mass.

Continuation-in-part of Ser. No. 689,358, May 20, 1976, abandoned, which is a division of Ser. No. 322,296, Jan. 10, 1973, Pat. No. 3,979,126, which is a continuation-in-part of Ser. No. 110,313, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 856,890, Sep. 2, 1969, abandoned, which is a continuation of Ser. No. 434,227, Feb. 23, 1965, abandoned. This application Mar. 17, 1977, Ser. No. 778,795

The portion of the term of this patent subsequent to Sep. 7, 1993, has been disclaimed.

Int. Cl.[2] A63B *37/02, 37/08, 37/12*
U.S. Cl. 273—220 **21 Claims**

1. A golf ball having the following physical characteristics:

Diameter	less than 1.70 inches
PGA Compression	at least 25
Hardness Shore "C" Scale	at least 60
Rebound 72 inch	at least 48 inches
Initial Velocity USGA	at least 230 feet/second

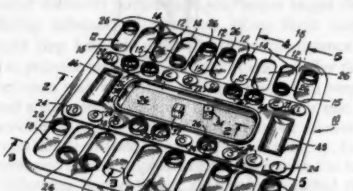
said golf ball comprising a core and a cover, at least one of which is prepared from a composition comprising a prepolymer of a polyether and a diisocyanate and a curing agent selected from the group consisting of trifunctional and tetrafunctional polyols and curing agents capable of curing the prepolymer and having at least two reactive amine groups, the prepolymer and the curing agent being present in an equivalent weight ratio of 1:1 ± 20%.

4,123,062

GAME WITH MULTIPLE CHOICE STRATEGY

Howard Wexler, New York, and Lawrence L. Reiner, Woodbury, both of N.Y., assignors to Mego Corp., New York, N.Y.

Filed Apr. 25, 1977, Ser. No. 789,860
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—248 **35 Claims**



1. In a game with multiple choice strategy for a player and an opponent player having alternate turns to play, a method of manipulating playing pieces consisting of a first plurality of playing pieces and a second plurality of playing pieces, the number of playing pieces in said first and second pluralities of playing pieces being equal, said first plurality of playing pieces relating to said player, and second plurality of playing pieces relating to said opponent player, each of said playing pieces in said first and second plurality of playing pieces relating to a distinct identifying symbol, the identifying symbol of each of said first plurality of playing pieces being the same as the identifying symbol of one of said second plurality of playing pieces, which comprises disposing each of said playing pieces at a location separate from the location of the balance of said playing pieces, said location for each playing piece being either

a start position, a vulnerable intermediate position to which the playing piece has been moved from said start position, or a non-vulnerable finish position to which the playing piece has been moved from said intermediate position, said player and said opponent player in alternate turn concomitantly manipulating a plurality of discrete identification means bearing identifying symbols, a first manipulation of said plurality of identification means being by said player and a second manipulation of said plurality of identification means being by said opponent player, each of said manipulation registering a plurality of said identifying symbols, said first player displacing, after said first manipulation of said plurality of identification means, and in correspondence to the symbols registered either on each or the combination of at least two identification means, at least one of said first plurality of playing pieces either from its start position or its finish position to its intermediate position, or at least one of said second plurality of playing pieces from its intermediate position to its start position, said player continuing his turn and manipulating said plurality of identification means until movement of a playing piece corresponding to each separate one or the combination of a plurality of registered identifying symbols is no longer possible, thereafter said opponent player moving all of said second plurality of playing pieces in intermediate position to finish position, thereafter said second player displacing, after said second manipulation of said plurality of identification means, and in correspondence to the symbols thereafter registered on each or the combination of at least two identification means, at least one of said second plurality of playing pieces either from its start position or its finish position to its intermediate position, or at least one of said first plurality of playing pieces from its intermediate position to its start position, said opponent player continuing his turn and manipulating said plurality of identification means until movement of a playing piece corresponding to each separate one or the combination of a plurality of registered identifying symbols is no longer possible, thereafter said player moving all of said first plurality of playing pieces in intermediate position to finish position, and continuing manipulation of said plurality of identification means alternately by said player and said opponent player until either said first pluraility of playing pieces or said second plurality of playing pieces is entirely disposed away from their start position.

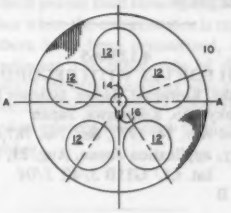
14. An article of manufacture consisting essentially of a game with multiple choice strategy for a player and an opponent player having alternate turns to play, comprising a flat planar playing board, a first plurality of linear channels on said board, a second plurality of linear channels on said board, said first and second plurality of channels consisting essentially of discrete slide spaces on the surface of said board, said first plurality of channels being juxtaposed in parallel substantially perpendicular to a first edge of said board, said second plurality of channels being juxtaposed in parallel substantially perpendicular to a second edge of said board, said second edge being opposite to said first edge, a first plurality of discrete means on said board, said first plurality of discrete means designating first finish positions, each of said first plurality of discrete means being on the surface of said board and juxtaposed with the inner end of one of said first plurality of channels, a second plurality of discrete means on said board, said second plurality of discrete means designating second finish positions, each of said second plurality of discrete means being on the surface of said board and juxtaposed with the inner end of one of said second plurality of channels, a plurality of distinct identifying symbols, each of said symbols relating to one of said channels and its associated discrete means, the identifying symbol of each of said first plurality of channels and discrete means being the same as the identifying symbol of one of said second plurality of channels and discrete means, a plurality of movable playing pieces, each playing piece being associated with one of said channels and associated discrete means, each playing piece being disposed either at one end of a channel or at its associated discrete means, and a plurality of discrete identification means bearing identifying symbols and capable of being manipulated.

4,123,063

REPLAY AND PROTECTIVE DISC FOR PHONOGRAPH RECORD CHANGERS

Martin J. Van Winkle, 338 Marlborough St., Boston, Mass. 02115

Filed Jan. 5, 1977, Ser. No. 757,090
Int. Cl.[2] G11B *3/62*
U.S. Cl. 274—1 R **2 Claims**



1. An accessory device for replaying and protecting phonograph records on automatic changers having a spindle and spindle record release lever, said device comprising:

a disc having a center hole and a keyway slot extending from said center hole, said keyway slot of sufficient size to slip over said release lever and wherein

the thickness of the central portion of said disc is less than the periphery of said disc;

the central portion of said disc is of a thickness at least about equal to the thickness of records to be played on the automatic changer; and

the diameter of said disc is no greater than the diameter of the labels of the records to be played on the automatic changer

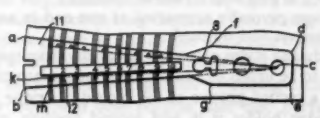
whereby during a single change cycle when the keyway is aligned with the release lever, the disc slides down the changer spindle with the underlying record and when the keyway is misaligned with the release lever, the disc remains atop the spindle.

4,123,064

PREDETERMINED INDEX GAUGE FOR LOCATING A SELECTED RECORD BAND ON A GRAMAPHONE RECORD

Kosuke Matsukata, 390 Tsurumi-cho, Tsurumi-ku, Yokohama, Kanagawa-ken, Japan

Filed May 24, 1977, Ser. No. 800,034
Claims priority, application Japan, May 26, 1976, 51-60159
Int. Cl.[2] G11B *3/00*
U.S. Cl. 274—1 R **3 Claims**



1. A method for forming a master index gauge for use in a phonograph record band selector comprising:

(a) shaping an index gauge pattern from a phonograph record having a plurality of recorded bands separated by at least one lead-in groove, said pattern including at least the spindle hole and a radial strip of said phonograph record;

(b) pin pricking through said pattern at each of said at least one lead-in groove;

(c) placing a blank master index gauge having a spindle hole therein onto a spindle;

(d) stacking said pattern on said spindle atop said blank master index gauge;

(e) transferring said pin pricking through said pattern onto said master index gauge by rotating said pattern above

said master index gauge with marking means extending through said pin prickings whereby registered arcuate lines are marked on said master index gauge;

(f) cutting said blank index gauge a predetermined distance along each of said arcuate lines;

(g) cutting said blank index gauge with cuts which intersect the cuts along said arcuate lines; and

(h) cutting through two sides of said spindle hole in said master index gauge.

4,123,065

PHONOGRAPH FOR USE WITH RECORD CARTRIDGES

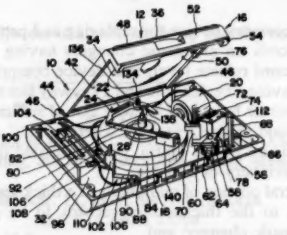
Katsumi Watanabe, Kawasaki, Japan, assignor to Yugen Kaisha Watanabe Kenkyusho, Kanagawa, Japan

Filed Apr. 14, 1977, Ser. No. 787,446

Claims priority, application Japan, Aug. 21, 1976, 51-100033

Int. Cl.[2] G11B *3/40, 3/04*

U.S. Cl. 274—9 B **6 Claims**



1. A sound reproducing apparatus for particular use with record cartridges of the type each having a phonograph record on a sheet-like record holder, comprising in combination:

a casing;

a cartridge holder mounted on said casing for pivotal movement between a first position for receiving a record cartridge and a second position for immovably holding the record cartridge with its record facing downwardly;

an upstanding spindle fixedly mounted within said casing and disposed in vertical register with the center of the record when said cartridge holder is in said second position;

a turntable mounted on said spindle so as to be both rotatable and movable up and down relative to same;

there being an aperture in said turntable;

a drive motor having an output shaft underlying the periphery of said turntable;

resilient means urging at least said output shaft of said drive motor upwardly into engagement with said turntable thereby urging said turntable upwardly;

a tone arm pivotally supported at one end in an eccentric position on said turntable;

a reproducing stylus extending upwardly from said tone arm so as to be urged by said resilient means into engagement with a record groove of the record cartridge when said cartridge holder is in said second position, said output shaft of said drive motor being held in frictional contact with the periphery of said turntable in driving relationship when said cartridge holder is in said second position;

a speaker cone mounted under said turntable for simultaneous rotation therewith, said speaker cone being disposed in concentric, back-to-back relationship to said turntable;

an armature connected to said speaker cone, said armature being at least partly exposed through said aperture in said turntable; and

a vibration transmitter rod substantially pivotally supported at one end on said turntable and resting at a point intermediate both ends thereof on said armature exposed through said aperture in said turntable, said tone arm resting at its free end on said vibration transmitter rod for sliding movement, during playback, from the other end of said vibration transmitter rod toward its point of contact with said armature.

4,123,066

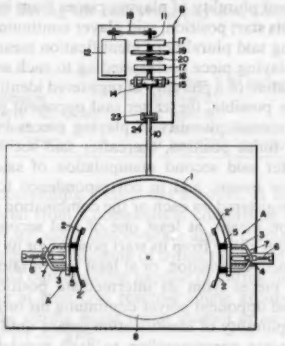
DEVICE FOR AUTOMATICALLY TURNING DISCS FROM SIDE TO SIDE

Hajime Minemura, 1-3-1, Fukasawa, Setagaya-ku, Tokyo, Japan; Haruya Kusama, and Shoichi Sato, both of Tokyo, Japan, assignors to Hajime Minemura, Tokyo, Japan

Filed Jul. 19, 1977, Ser. No. 816,923

Int. Cl.[2] G11B *15/00*

U.S. Cl. 274—10 C **8 Claims**

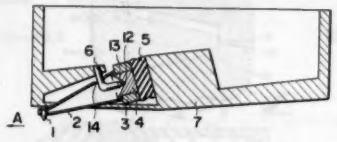


1. A device for automatically turning over a record disc mounted on a turntable rotatable on a base, said device comprising, in combination, an arcuate main arm extending, in an inactive position, partially around a record disc on the turntable and in substantially concentric radially spaced relation to the record disc; respective disc engaging arms slidably mounted on opposite ends of said main arm; respective stop means on said base operatively engageable with said disc engaging arms; respective first spring means biasing said stop means away from the disc to retain the associated disc engaging arms disengaged from the disc; respective second spring means biasing said disc engaging arms toward the disc; the biasing force of said first spring means being greater than that of said second spring means; respective electromagnetic means operable, when energized, to move said stop means, against the bias of said first spring means, toward the disc for engagement of said disc engaging arms, under the bias of said second spring means, with the disc; a main shaft secured to said main arm intermediate the ends thereof and extending radially outwardly therefrom; support means engaging said main shaft intermediate its ends and providing for rotation of said main shaft about its axis and for swinging of said main shaft between said inactive position of said main arm and an active position in which said main shaft extends outwardly at an angle to the horizontal sufficiently large to allow rotation of said main arm in clearing relation with the turntable; a drive shaft; a motor in driving relation with said drive shaft; a cam secured to said drive shaft and engageable with said main shaft, upon rotation of said drive shaft to swing said main shaft to said active position; a first gear on said main shaft; gear means fixed to said drive shaft and engageable with said first first gear, only when said main shaft is in said active position, to rotate said main shaft through exactly 180° responsive to rotation of said drive shaft; said cam, at the end of said rotation of said main shaft, providing for return movement of said main shaft to the inactive position in which said electromagnetic means are deenergized for movement of said disc engaging arms by said stop means under the bias of said first spring means, away from the disc.

4,123,067
STYLUS VIBRATING MECHANISM IN PICKUP CARTRIDGE

Tsugikuma Minamizono, Numazu, Japan, assignor to Kabushiki Kaisha Mitachi Onkyo Seisakusho, Numazu, Japan

Filed Jul. 6, 1977, Ser. No. 813,401
Claims priority, application Japan, Jul. 7, 1976, 51-90092[U]; Sep. 16, 1976, 51-124744[U]; Dec. 8, 1976, 51-164565[U]; May 13, 1977, 52-61271[U]; May 13, 1977, 52-61272[U]
Int. Cl.[2] G11B 3/02
U.S. Cl. 274—37 11 Claims

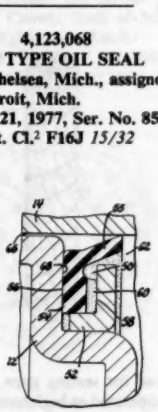


1. A stylus vibrating mechanism in a pickup cartridge comprising;
- a cantilever having a stylus tip at the fore end and a through hole provided therethrough,
- a magnet disposed continuously to said cantilever,
- a pivot suspension, formed integrally with said magnet, having a tapered conical hole of a desired depth formed on said pivot suspension, the bottom of the hole being positioned substantially at the center of one surface of said magnet opposed to the stylus tip and substantially on the longitudinal center axis of said cantilever,
- a rubber damper located behind said pivot suspension and said magnet to form a vibration transmission part with the magnet and the pivot suspension,
- a stylus case anchored to a cartridge case supporting fixedly behind said rubber damper, and
- a pivot having a pointed fore end to be inserted into the conical hole of said pivot suspension in the direction from the stylus tip of the cantilever and in parallel with the longitudinal center axis in such a manner that the fore end of the pivot is in contact with the bottom of the conical hole of said pivot suspension and applies pressure to said rubber damper and that the other end of the pivot extends outward from the cantilever via the through hole and is anchored to the stylus case while being kept out of contact with the through hole.

4,123,068
LIP TYPE OIL SEAL

Jack H. Van Gorder, Chelsea, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 21, 1977, Ser. No. 853,287
Int. Cl.[2] F16J 15/32
U.S. Cl. 277—27 1 Claim

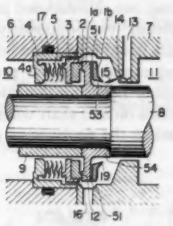


1. A lip type seal member for a piston and cylinder wherein the seal member is disposed in an annular seal groove formed on the piston or cylinder and cooperates with the piston and cylinder to define two working chambers and wherein pressurized fluid is admitted to one chamber during a first operating condition and to both chambers during a second operating condition and wherein the pressurized fluid is exhausted from the one chamber more rapidly resulting in a pressure reversal on the seal upon completion of the second operating condition; said seal comprising an annular body portion disposed in the seal groove and having a non sealing annular surface adjacent one side of the annular seal groove facing toward the one chamber which non sealing annular surface has a plurality of radial grooves which permit fluid flow from the other chamber to the one chamber when the one chamber is rapidly exhausted after both chambers have been pressurized, and an annular sealing surface adjacent the other side of the annular seal groove facing toward the other chamber which annular sealing surface seals in the annular seal groove when the one chamber only is pressurized to prevent fluid flow from the one chamber to the other chamber.

4,123,069
MECHANICAL SEALING DEVICE

Akira Sato, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 18, 1976, Ser. No. 733,309
Claims priority, application Japan, Jul. 23, 1976, 51-97536[U]
Int. Cl.[2] F16J 15/36
U.S. Cl. 277—70 7 Claims



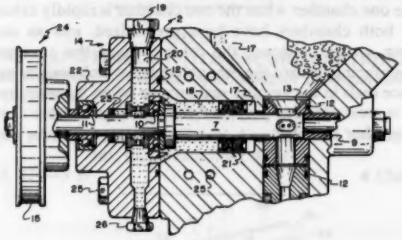
1. The combination of casings, a rotary shaft rotatable at high rpm and extending through said casings, and a mechanical sealing device, said sealing device comprising:
- first and second stationary ring members arranged in surrounding and concentric relation to the rotary shaft;
- a resilient bellows interposed between said first and said second stationary ring members;
- a rotatable ring structure on the rotary shaft, said rotatable ring structure comprising third and fourth ring members rotatable together as a unit, said third ring member comprising a sleeve-shaped boss portion disposed around the rotary shaft and a disc portion extending radially outwardly from said boss portion, said disc portion being substantially radially coextensive with said fourth ring member;
- said first ring member being affixed to one of said casings;
- said second ring member being urged against said rotatable ring structure in sliding relation thereto by said bellows;
- means defining a plurality of radially extending passages between said third and fourth ring members, each of said passages being substantially perpendicular to the axis of said rotary shaft and extending substantially from the radially inner end to the radially outer end of the fourth ring member and of the disc portion of the third ring member;
- a supply port defined in one of said casings for a cooling medium, said port being open to the radially inner end of said radially extending passages.

4,123,070

HIGH PRESSURE HIGH TEMPERATURE LIGHT GAS DRIVE SHAFT SEAL

William D. Peterson, II, 1996 E. 4675 South, Salt Lake City, Utah 84117

Filed Oct. 5, 1976, Ser. No. 729,695
Int. Cl.[2] F16J 15/40
U.S. Cl. 277—135 2 Claims



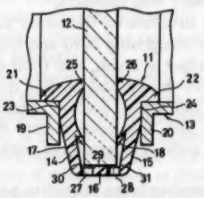
1. In a structure including a closed vessel pressured by confined gas therein, a shaft extending through a bore in the wall thereof, a bearing inside said vessel and a bearing outside said vessel journalling said shaft for rotation in said bore, an improved seal for said shaft comprising a pair of spaced apart shaft seals including an inner seal and an outer seal between said spaced apart bearings and encircling said shaft in said bore, said inner seal having one side exposed to pressured gas in said vessel, and comprising two oppositely axially opening U-shaped seal elements liquid filling said bore between said seals; and said inner seal exposed to said pressured gas from the interior of said vessel being axially slidable in an extended cylindrical bore recess on said shaft whereby to cause pressure on said liquid equal to the pressure of gas inside said closed vessel.

4,123,071

WATER-DRAINABLE GASKET

Yukio Yamamoto, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 21, 1977, Ser. No. 835,181
Claims priority, application Japan, Sep. 22, 1976, 51-128309[U]; Oct. 8, 1976, 51-136147[U]
Int. Cl.[2] E06B 7/23, 7/26
U.S. Cl. 277—205 8 Claims



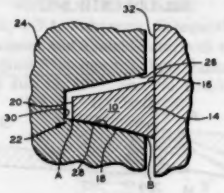
1. A water-drainable gasket for use between a panel and a frame disposed peripherally around the panel, comprising: a continuous resiliently flexible body of a substantially U-shaped cross-section for extending around and receiving the peripheral edges of the panel, said body including a pair of spaced sidewalls and a bottom extending between and interconnecting said sidewalls; and a plurality of pairs of transversely spaced passage means extending through said bottom, said passage means in each pair being transversely aligned with each other, and said pairs of passage means being located at a spaced interval along the length of said continuous body.

4,123,072

PISTON RING ASSEMBLY AND METHOD OF MAKING SAME

Robert L. Sharpe, Richmond, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 18, 1977, Ser. No. 779,281
Int. Cl.[2] F02F 5/00; F16J 9/20
U.S. Cl. 277—216 7 Claims



1. A piston and piston ring assembly for a fluid pressure cylinder comprising:

a piston with a peripheral groove having at least one inwardly converging side wall; and

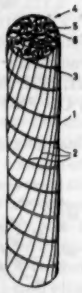
a piston ring having an outer peripheral wall, an inner peripheral wall having an axial dimension less than the outer wall, and at least one wall tending to inwardly converge from the outer wall to the inner wall, said piston ring being loosely received within the peripheral groove of said piston with the inwardly converging wall in facing relation to the inwardly converging wall of the groove of said a piston, wherein at least one of the inwardly converging walls of said piston and said piston ring is of concavely curved cross-section over a major portion of the wall thereof so as to establish line-to-line contact between the facing wall.

4,123,073

SEALING BEAD FOR USE AT HIGH TEMPERATURES

Willi Cremerius, Benrodestrasse 7, 4 Dusseldorf-Benrath, Germany

Filed Aug. 24, 1976, Ser. No. 717,182
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1975, 2538765
Int. Cl.[2] F16J 15/10
U.S. Cl. 277—229 5 Claims



1. A sealing bead for sealing gaps in installations and machines which are operated at high temperatures, characterized in that the bead comprises a plurality of folded strips of paper consisting of from 60 to 80% of crimped paper and from 20 to 40% of tissue paper which is free of wood pulp, each of the paper strips having a surface/weight ratio not exceeding 30 grams per square meter, the strips of paper being twisted together to form a generally helically arranged bundle of strips which are bound together by a helical thread of unwaxed

hemp with a thickness of about 0.3 mm, the helix formed by the thread being pitched less steeply than the helix formed by each of the strips.

4,123,074

TOOL SHANK AND CHUCK COMBINATION FOR A HAMMER DRILL

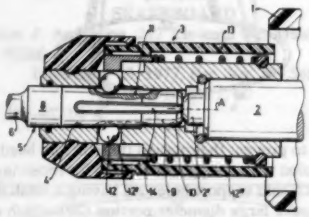
Karl Wanner, Echterdingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 11, 1977, Ser. No. 840,624

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1976, 2650134

Int. Cl.[2] B25D *17/08*

U.S. Cl. 279—19.5 **10 Claims**



1. In combination with a chuck having a tool receptacle defining a chuck axis and tool-holding element radially displaceable into a position protruding into said receptacle, a tool having a shank which defines a tool axis and has a portion receivable axially in said receptacle, and having a free end, said shank being formed with a radially outwardly open recess closed at both of its axial ends and adapted to receive said tool-holding element, and with an axially extending groove separate from said recess and open axially at said free end, at least a section of said portion of said shank having a conical shape decreasing in a direction towards said free end and said chuck has a projection engaging in said axial groove of said shank.

4,123,075

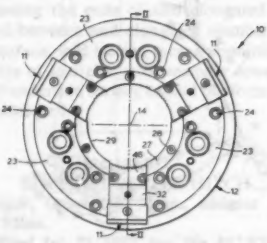
SLEEVE-ENCASED JAW CHUCK

William V. Rosewarne, Portage, and Gerald W. Norton, Brady Township, Kalamazoo County, both of Mich., assignors to Buck Tool Company, Kalamazoo, Mich.

Filed Sep. 6, 1977, Ser. No. 830,388

Int. Cl.[2] B23B *31/16*

U.S. Cl. 279—121 **12 Claims**



1. In a rotatable jaw chuck construction having body means, a plurality of jaw assemblies radially movably supported on said body means and adapted for gripping engagement with a workpiece, and axially movable actuator means interconnected to said jaw assemblies for radially displacing same into clamping engagement with a workpiece, comprising the improvement wherein:

said body means includes an inner sleevelike body having a plurality of guide slots formed therein and spaced circumferentially therearound, said guide slots extending substantially radially with respect to the longitudinal axis of said inner body and having said jaw assemblies slidably supported therein;

said actuator means including a plurality of slidable actuating wedges, each wedge being axially slidably supported on said body means and disposed in slidable camming engagement with a respective said jaw assembly for causing radial displacement thereof in response to axial displacement of said wedge; and

said body means including an outer sleevelike body fixed with respect to the inner body and disposed in snug surrounding relationship thereto, said outer body having an inner peripheral surface which axially slidably bearingly engages with a radially outer bearing surface formed on said actuator wedge, whereby centrifugal forces imposed on the jaw assembly are transmitted therefrom through said wedge to said outer body.

4,123,076

PAIR OF ROLLERS FOR ROLLER-SKATES

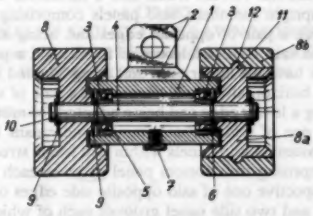
Gianfranco Passoni, Rte. de la Veveyse 24,, 1700 Fribourg, Switzerland

Filed Mar. 30, 1977, Ser. No. 782,664

Claims priority, application Switzerland, May 4, 1976, 04263/76

Int. Cl.[2] A63C *1/00*

U.S. Cl. 280—11.27 **3 Claims**



1. A roller assembly, for roller skates, comprising:

(i) a hollow mandrel having on it a radially projecting member for attachment of the mandrel to a shoe support, said mandrel being recessed internally at each end,

(ii) a pair of ball races each including an inner ring and an outer ring, the outer ring of each race being disposed in a respective end recess of the mandrel,

(iii) a spindle engaged in and projecting axially at each end beyond the inner rings of the races, said spindle having two axially-spaced circumferential radial recesses in each of its projecting end portions,

(iv) a first pair of resilient washers engaged in a first pair of said radial recesses and each abutting the inner ring of a respective ball race, to lock the spindle and the ball races against axial movement relative to the mandrel,

(v) a pair of rollers mounted to be freely rotatable each on a respective projecting end portion of the spindle and,

(vi) a second pair of resilient washers engaged in the other pair of said radial recesses and each serving to retain a respective one of said rollers on the spindle.

4,123,077

GOODS TRANSPORT CART WITH MOLDED PLASTIC PANEL

Raymond Joseph, Schiltigheim, France, assignor to Ateliers Reunis Societe Anonyme, Schiltigheim, France

Filed Dec. 1, 1976, Ser. No. 746,327
Claims priority, application France, Dec. 16, 1975, 75 38435
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—47.34 10 Claims

1. A cart for transporting loose articles and having a basket adapted to contain said articles, said cart comprising a plurality of discrete panels of molded plastic material; a frame structure comprising a rigid metallic ossature including a plurality of rigid components defining the contours of said basket and thereby constituting a frame of said basket, said frame being arranged to receive said panels to thereby define a plurality of walls for the basket, said ossature comprising a horizontal bottom frame having two opposite side edges, and a pair of vertical side frames each having a lower edge which is integral with a respective one of said edges and further comprising two upright members each being connected to a rear portion of a respective one of said vertical side frames and to a rear portion of said horizontal bottom frame and a handlebar connecting said two upright members, said panels comprising a bottom panel having a pair of opposite edges and being adapted for mounting in said horizontal bottom frame, and a pair of side panels each having a lower edge and being adapted for mounting in said horizontal bottom frame, and a pair of side panels each having a lower edge and being adapted for mounting in a respective one of said vertical frames; and means for assembling and fastening said panels within said frame structure, said means comprising two bottom panel grooves each extending along a respective one of said opposite side edges of said bottom panel, and two side panel grooves each of which extends along a lower edge of a respective one of said side panels, said bottom panel grooves each being fittable over a respective one of said opposite side edges of said horizontal bottom frame and said side panel grooves each being fittable over said lower edge of a respective one of said vertical side frames.

4,123,078

BABY WALKER WITH DEVICE FOR SUPPORTING STEM FOR BEADS

Mitsuo Murakami, Higashi-Osaka, Japan, assignor to Kabushiki Kaisha Famy, Osaka, Japan

Filed Sep. 24, 1976, Ser. No. 726,159
Int. Cl.[2] A47D *13/04*
U.S. Cl. 280—87.02 W 1 Claim

1. A baby walker comprising a table (1) providing a tray (6) and an opening (5) under which a saddle (9) is suspended; said table (1) being formed with a peripheral ridge (7) of substantially inverted U-shaped cross-section integral therewith, the inner surface of said ridge being formed with radial reinforcing ribs (8); legs (3) for supporting said table (1) on a frame (2) having casters (4) thereon; a stem (12) for carrying ornamental beads (10) comprising a core rod covered by a plastic tube (13) and having a bulge (24) formed on each end thereof; support means comprising, at each said end, a support member (14) for supporting said stem (12), a number of ornamental beads (10) rotatably slidably mounted on said stem, said support member being formed with a head portion (16) and a trunk portion (15); said trunk portion (15) being mounted on said ridge (7) with rotation-preventive projections (22) adapted to a hole of said

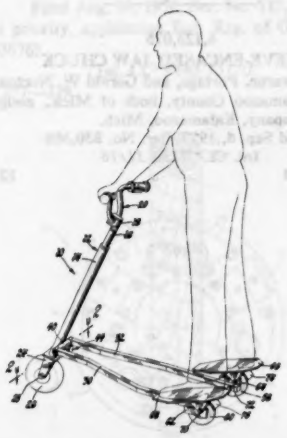
ridge (7) so as to prevent the rotation thereof; said head portion (16) being formed with a support hole (18) for receiving an end of said stem (12) said support hole (18) having a small diameter portion (19) and a large diameter portion (20) which differ in inner diameter, said small diameter portion (19) snugly receiving said stem (12), said large diameter portion (20) serving to grasp said bulge (24) formed on said end of stem (12), said bulge (24) being locked by the step in said support hole (18) at the junction between the different diameters.

4,123,079

OCCUPANT PROPELLED CAMBERING VEHICLE

Edward J. Biskup, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 21, 1977, Ser. No. 779,337
Int. Cl.[2] B62M *1/04*
U.S. Cl. 280—220 4 Claims



1. A three-point surface contact cambering vehicle having a longitudinally extending roll axis and comprising an upright steering column, an elongated steering shaft mounted in said steering column for turning movement about a substantially vertical axis, a steerable front surface contact means operatively connected to the lower end of said steering shaft for engagement with a support surface, a manual steering device operatively connected to the upper end of said steering shaft, a

pair of elongated trailing arms extending rearwardly from said steering column and each having a front portion and a rear portion, laterally spaced rear surface contact means operatively connected to the rear portions of said trailing arms for engagement with the support surface, foot support means for an operator of the vehicle mounted on each of said trailing arms adjacent to each of said rear surface contact means, and spring means connecting the front portions of said trailing arms to said steering column and serving as the sole support for permitting said trailing arms to swing about a transverse axis and thereby allow the operator to roll said vehicle with respect to said roll axis and cause said trailing arms to move in opposite directions so that the rear surface contact means camber by an amount substantially equal to the vehicle roll.

4,123,080

SKATEBOARD

Christopher J. Agajanian, 217 Eleventh St., Manhattan Beach, Calif. 90266

Filed May 23, 1977, Ser. No. 799,545
Int. Cl.² B62M *1/00*
U.S. Cl. 280—87.04 A **7 Claims**

5. A skateboard comprising:

a platform having a front end, a back end, a lengthwise axis, an underside surface and an upper surface for accommodating the feet of a rider during the riding of the skateboard;

a front wheel assembly positioned under the plane of said platform and proximate said front end thereof;

a back wheel assembly positioned under the plane of said platform and proximate said back end thereof;

suspension means interposed between said platform and said wheel assemblies, said suspension means including biasing means and an elongated flexible member secured generally at its mid-section to said platform and substantially midway between said ends and extending in a direction substantially parallel to said lengthwise axis of said platform, said biasing means comprising cylindrical rods, with one of said rods on each side of the secured mid-section of said elongated member, said elongated member having at its ends said front and back wheel assemblies secured thereto with the ends of said elongated member biased from said underside surface of said platform; said biasing means biasing the ends of said elongated member and positioned between said elongated member and said underside surface, said biasing means permitting movement of the ends of said elongated member toward and away from said underside surface of said platform during riding of the skateboard.

4,123,081

BEET HARVESTER HITCH

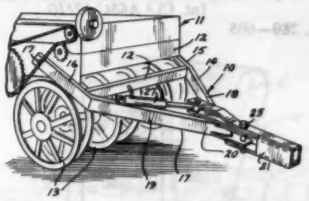
Earl H. Ellinger, Crookston, Minn., assignor to Dee, Inc., Crookston, Minn.

Filed Jul. 22, 1977, Ser. No. 817,928
Int. Cl.² B60D *1/14*
U.S. Cl. 280—463 **2 Claims**

1. A hitch for beet harvesters and the like for attachment to a tractor, comprising

a hitch frame spanning the width of the harvester and having rearwardly extending outer ends for attachment to the harvester, the hitch frame also having a rigid transverse beam connecting the outer ends together, the beam having side portions extending obliquely of each other and forwardly, and converging on each other at an apex, the side portions of the transverse beam having front faces occasionally engaged by the tractor tires during turning of the tractor,

a fore and aft extending hitch bar with a front end with a pivot adapted for attachment to the drawbar of such a tractor, the hitch bar traversing the apex of the transverse beam and having a pivot connecting the hitch bar to the



transverse beam adjacent the apex thereof for transverse and generally horizontal swinging relative to the hitch frame, the rear end of the bar being disposed significantly behind the apex, and

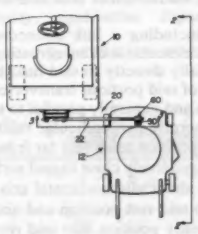
a hydraulic steering cylinder extending transversely of the hitch bar and being pivotally connected to one side portion of the beam and to the hitch bar adjacent the rear end thereof, the cylinder being disposed entirely behind the front face of said one side portion of the beam.

4,123,082

POSITIONALLY ADJUSTABLE LAWN MOWER HITCH

Joe D. Conner, Box 5695 Kilcrease Rd., Auburn, Ga. 30203

Filed May 6, 1977, Ser. No. 794,686
Int. Cl.² B60D *1/14*
U.S. Cl. 280—467 **15 Claims**



1. A hitch for connecting a towed mower to a towing mower comprising:

a trunnion on said towing mower having the axis thereof substantially vertical,

an L-shaped rod in a substantially vertical plane having a finger portion in said trunnion and an extending arm,

means for releasably securing said rod in either of two positions in which said arm extends to one side or the other of the towing mower,

and means for connecting said rod to a towed mower,

whereby said towed mower may be selectively positioned laterally on either side of said towing mower.

4,123,083
SKI BRAKE

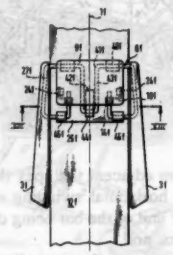
Tilo Riedel, Eching, Fed. Rep. of Germany, assignor to S.A. Etablissements Francois Salomon & Fils, Annecy, France

Continuation-in-part of Ser. No. 666,232, Mar. 12, 1976. This application Apr. 20, 1976, Ser. No. 678,706

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1975, 2512052; Apr. 22, 1975, 2517794; Apr. 22, 1975, 2517838; Apr. 22, 1975, 2517820; Apr. 22, 1975, 2517829; Apr. 22, 1975, 2517862; Apr. 22, 1975, 2517861; May 2, 1975, 2519779

Int. Cl.[2] A63C *17/10*

U.S. Cl. 280—605 28 Claims



1. A brake for an elongated ski having an upper surface and a pair of sides, said brake comprising:

a support securable to said upper surface of said ski;

pivot means on said support defining a horizontal pivot axis generally parallel to said surface and transverse to said ski and an upright pivot axis generally perpendicular to said surface and transverse to said ski;

an elongated brake element at a respective one of said sides of said ski and having an upper end portion, a lower end, and an intermediate portion, one of said portions being secured to said pivot for pivoting of said element about said horizontal axis between a braking position extending transverse to and downwardly past said ski and a rest position extending generally parallel to and lying above said surface, said element further being pivotal about said upright axis in said rest position between a ready position in which said lower end is spaced laterally relative to the longitudinal direction of said ski from the respective side of said ski and a retracted position in which said lower end overlies said surface;

a pivot spring engaged between said element and said support and urging said element into said braking position; and

actuating means including a link connected substantially directly to said element and an actuating member connected substantially directly to said link, bearing through said link on one of said portions transversely of said longitudinal direction and generally parallel to said surface, and displaceable generally perpendicular relative to said surface from an up position relatively far from said surface to a down position relatively close to said surface for displacing said element about said horizontal axis from said braking position into said rest position and about said upright axis from said ready position into said retracted position.

4,123,084
SKI BOOT TOE BINDING

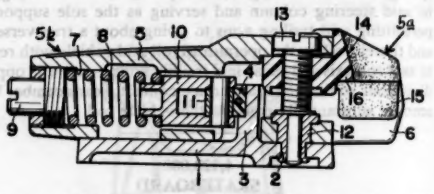
Tohru Takahashi, Tokyo, Japan, assignor to Hope Co., Ltd., Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,484

Int. Cl.[2] A63C *9/08*

U.S. Cl. 280—630 4 Claims

1. A ski boot toe binding comprising a base plate adapted to be attached on a ski, a metallic main body having a toe holder at one end thereof, a pivot means provided at said one end of said main body adjacent said toe holder for rotatably mounting said main body upon said base plate, a vertical extension on said base plate spaced from said pivot means, a cam member fixed on said extension and having a cam surface thereon on the side thereof facing toward the opposite end of said main body, said cam member being separate from said pivot means and projecting into an opening in said main body between said pivot means and the said opposite end of said main body, a



piston within said body member and movable longitudinally thereof, a roller on the end of said piston adjacent said cam surface, and a horizontally disposed compression spring urging said roller against the cam surface of said cam member, whereby a lateral force against the ski boot will rotate said main body toward a toe releasing position, friction will be minimized and restitution forces will be increased.

4,123,085
SAFETY PANELLING ARRANGEMENT WITH A DEFORMABLE STRUCTURE

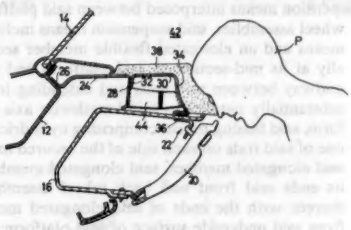
Takaaki Oda, Musashi-Murayama, and Chiyokatsu Yokokura, Kunitachi, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Jan. 28, 1977, Ser. No. 763,334

Claims priority, application Japan, Jan. 31, 1976, 51/10542[U]

Int. Cl.[2] B60R *21/08*

U.S. Cl. 280—752 13 Claims



1. A safety panelling arrangement for a motor vehicle having a floor and an elongate rigid member transversely disposed in said vehicle at a front portion of the passenger compartment under the windscreen, comprising:

a first elongate sheet member transversely disposed in said vehicle and having the front end thereof fixed to said elongate rigid member and the rear end portion thereof bent downwardly, the rear end portion of said first elongate sheet member forming a first supporting part the lateral axis of which is substantially perpendicular to the longitudinal axis of said vehicle;

a second sheet member transversely disposed in said vehicle and having the front end thereof fixed to the rear surface of said first elongate sheet member and the rear end portion thereof bent downwardly, the rear end portion of said second elongate sheet member forming a second supporting part the lateral axis of which is substantially parallel with that of said first supporting part; and

a straightly extending member firmly spanned substantially horizontally between said first and second supporting

parts, at a position below an area where said second elongate sheet member is fixed to said first elongate sheet member, in a manner that the longitudinal axis of said straightly extending member is inclined with respect to an imaginary plane which is perpendicular to said floor and includes therein said longitudinal axis of said vehicle, said area being an area most likely impacted by the head of a passenger in a passenger compartment in a vehicle collision.

4,123,086

CONTINUOUS STATIONERY ASSEMBLIES

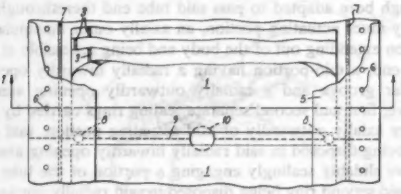
Denis E. E. French, London, England, assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,861

Claims priority, application United Kingdom, Jul. 21, 1976, 30406/76

Int. Cl.² B41L *1/20*

U.S. Cl. 282—11.5 A **7 Claims**



1. A series-connected business form adapted to be fed through the printing means of a business machine, comprising a continuous locating web folded inwardly along marginal edges thereof to define longitudinal flaps having edges spaced transversely of one another, said flaps overlying said web, at least one of said flaps and said web underlying same each having feed holes extending longitudinally thereof in superimposed relationship and being arranged to engage the feed means of the business machine so that the business form is thereby advanced into and past the printing means, said flaps being attached to said web by first and second securement means respectively spaced outwardly of said flap edges, said web and said flaps having spaced transverse lines of perforations for separating the form therealong into individual units, individual sheets respectively associated with said units and overlying said web, each said sheet having first opposed marginal edges lying inwardly of said first and second securement means and having second opposed marginal edges respectively spaced inwardly of said transverse lines of perforations, means on said locating web lying adjacent said second opposed edges for immobilizing said sheets against shifting longitudinally of said web, and portions of said flaps overlapping said first marginal edges of said plies, whereby upon the printing of a number of said units, the next to the last of said units so printed may be separated along one of said transverse lines of perforations whereafter one of said sheets associated with the last of said units may be separated from said web to thereby leave said web of said last unit available as a drive web for initiating the feed of the remaining units to be printed through the printing means.

4,123,087

TYPING GUIDE

Alvin J. Baron, 718 Sherwood St., North Woodmere, N.Y. 11581

Filed Oct. 11, 1977, Ser. No. 841,105

Int. Cl.² B42D *15/00*

U.S. Cl. 283—1 R **19 Claims**

1. A typing guide, comprising:

a single typewriter backing sheet adapted to underlie a sheet of typing paper when inserted in a typewriter, said backing sheet having front and back surfaces, and top, bottom and side edges, and footnote indicator means printed directly on said front surface for providing an indication of the space needed to type the required number of footnotes near the bottom portion of the sheet of typing paper.

11. A method of typing footnotes using a typing guide formed of a single backing sheet having a front and back surface with a plurality of marks in vertical sequence extending from the lower edge and printed adjacent one side of the front surface, the marks being numerically identified by a progressively increasing sequence of numbers, commencing from the lower most mark, said method comprising the steps of:

(a) placing a sheet of typing paper over the front surface of the backing sheet with the marks exposed at one side of the typing paper;

(b) inserting the typing paper and underlying backing sheet into the typewriter;

(c) typing the desired text material on the typing paper sequentially identifying the footnote numbers included in the text of that page;

(d) terminating typing of the text material when reaching the mark having the same identifying number as the last footnote number typed; and

(e) typing the footnotes on the remainder of the page.

4,123,088

LEAKAGE PREVENTIVE MECHANISM FOR FLEXIBLE HOSES

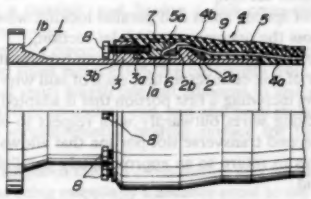
Mamoru Tanaka, Yokohama, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Feb. 6, 1978, Ser. No. 875,709

Claims priority, application Japan, Feb. 16, 1977, 52/16531[U]

Int. Cl.² F16L *39/02*

U.S. Cl. 285—14 **4 Claims**



1. A leakage preventive mechanism for flexible hoses, comprising a nipple flange including a nipple portion engageable with an end portion of a flexible hose, a rib and a bolt supporting base made integral with said nipple portion of the nipple flange and circumferentially extending around said nipple portion, said rib and bolt supporting base being axially spaced apart from each other, a reinforcing layer embedded in said flexible hose and surrounding an end of said nipple portion of the nipple flange, said reinforcing layer having a front end

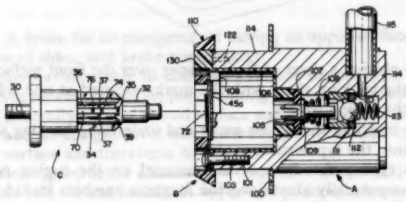
portion passing over said rib toward said bolt supporting base, a bead wire surrounding said front end portion of said reinforcing layer, said front end portion of said reinforcing layer being wrapped around said bead wire from its lower portion toward the upper portion thereof to form a turn-back portion inclined at an angle to said nipple portion of the nipple flange, a pair of rings surrounding said nipple portion and circumferentially making contact with the outside surface of said inclined turn-back portion of said reinforcing layer, and a plurality of bolts threadedly engaged with said bolt supporting base and urging said rings through said inclined turn-back portion of said reinforcing layer and said bead wire against said rib.

4,123,089

GAS SERVICE UNIT

Laurence Viero; John Cannon; George Rademaker; Williard Swanson, and Kenneth Fessett, all of Chicago, Ill., assignors to Oxequip Health Industries Inc., Chicago, Ill.

Filed Feb. 28, 1977, Ser. No. 773,035
Int. Cl.² F16L *21/00*
U.S. Cl. 285—39 **1 Claim**



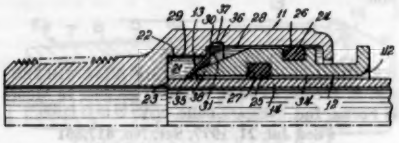
1. In the known gas outlet device comprising in combination
(a) a valve housing,
(b) an inlet section to said valve housing, said inlet section having an opening, and
(c) a connector tube that has one end that is adapted to be inserted through said openings and interengaged with said inlet section so as to cause the flow of gas through said valve housing, said inlet section and said connector tube,
the improvement which comprises
(1) the perimeter of said opening containing diametrically opposed slots,
(2) two diametrically opposed elongated ridges extending along the exterior surface of said connector tube, said elongated ridges being adapted to pass through said slots in said inlet section,
(3) a pair of spaced apart and parallel locking wires extending across the opening of said inlet section,
(4) two spaced apart wire engaging members located on the exterior of said connector tube, each of said wire engaging members including a first portion that is adapted to spread said locking wires outwardly with respect to each other and a second transverse slot portion that allows the locking wires to return to an approximately parallel relationship, and
(5) a disengager member associated with said connector tube which will when activated by pulling said connector tube, dislodge said locking wires from said transverse slot portion,
whereby by pushing said connector tube into said inlet section said locking wires will engage with said transverse slot portions to thereby hold the connector tube and inlet section together and by pulling said connector tube away from said inlet section said disengager member will dislodge said locking wires from said transverse slot portion.

4,123,090

PUSH-PULL FITTING

Mike D. Kotsakis, Mount Prospect, and Albert J. Schwarz, Lincolnwood, both of Ill., assignors to Imperial-Eastman Corporation, Chicago, Ill.

Filed Jul. 19, 1976, Ser. No. 706,823
Int. Cl.² F16L *21/02*
U.S. Cl. 285—39 **14 Claims**



1. In a tube fitting having a body provided with a through bore having an outwardly opening end adapted to receive the end of a tube, the improvement comprising: a one-piece annular carrier axially movably retained in said bore end having a through bore adapted to pass said tube end therethrough, an axially inner actuating portion, an axially outer manipulating portion extending out of the body and being accessible at said bore end, a mid-portion having a radially inwardly opening annular groove and a radially outwardly opening annular groove; first and second separate sealing rings carried by said carrier axially outwardly of said actuating portion, said first ring being disposed in said radially inwardly opening annular groove slidably sealingly engaging a portion of the tube end and said second ring being disposed in said radially outwardly opening annular groove slidably sealingly engaging only the body for maintained accurately prestressed sealing of said tube end to the body; a retainer positioned axially inwardly of said sealing rings and having at least one radially and axially inwardly projecting spring finger terminating in a locking edge axially inwardly of said carrier; and means positioned axially inwardly of said sealing rings for retaining said retainer to said body in said bore end to have said locking edge of the spring finger resiliently biased against said tube end axially inwardly of the portion thereof engaged by said first sealing ring while permitting said tube end to be moved axially inwardly into said bore end past said spring finger and to lock said tube as an incident of attempted subsequent axial outward movement of said tube end, thereby to retain said tube end in said bore end, said carrier actuating portion being axially inwardly movable in said bore end directly with said manipulating portion while effectively maintaining said prestressed sealing to cause said actuating portion to engage effectively positively said spring finger and urge the locking edge thereof radially outwardly from said tube end thereby to permit axial withdrawal of said tube end from said bore end through said carrier bore.

4,123,091

TUBE CONNECTOR

Louis C. Cosentino, Wayzata, and B. Steven Springrose, Minneapolis, both of Minn., assignors to Renal Systems, Inc., Minneapolis, Minn.

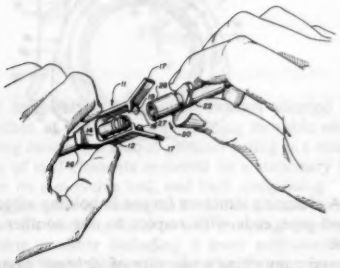
Filed Nov. 21, 1977, Ser. No. 853,133
Int. Cl.² F16L *21/08, 37/12*
U.S. Cl. 285—39 **9 Claims**

1. A flow-through connector assembly for use in transmitting the flow of blood and other fluids, comprising in combination:
a. first and second connector bodies adapted to be couplingly connected together and to be readily disconnected by relative rotation of at least one of said bodies about the body axis and the separation of the two bodies;
b. the connector bodies each being characterized by a coaxial fluid passageway therethrough with each body having one end thereof adapted to be joined to a fluid conduit and an opposite end adapted for mutual connection with the other connector body to form a continuous fluid passage-

way therethrough when the bodies are connected together;

c. the said opposite end of one of the connector bodies including a male tubular member and the said opposite end of the other connector body including a female tubular member for receiving the male member upon connecting the two connector bodies together, each of the tubular members comprising a portion of the fluid passageway;

d. a pair of resilient arm members formed integrally with the first connector body and positioned along opposite sides of the tubular member on the first connector body and extending parallel thereto beyond the end of the tubular member at which point each arm has a flared segment which flares outwardly at an acute angle with respect to the longitudinal axis of the connector body and which is of a length approximating the length of said arm, and an inwardly extending flange member carried by each arm at a position beyond the end of the tubular member for receiving the tubular member carried by the second connector body when the two connector bodies are being connected together, the distance between the inward ends of the flanges being less than the outside diameter of the tubular member carried by the second connector body whereby the arms are resiliently spread apart when the tubular member is received between the flanges; and,



e. The second connector body being further characterized by an annular recessed collar positioned inwardly of the tubular member carried thereby for receiving the flanges of the first connector body when the tubular members are joined thereby connecting the connector bodies together, and a pair of oppositely positioned members formed integrally with and extending outwardly from the sides of the second connector body from an inward position beyond the recessed collar and the tubular member, the outwardly extending members being of such a length as to bear against the flaring arms when the connected connector bodies are rotated relative to each other whereby the flanges are lifted out of the recessed collar and the connector bodies may be disconnected by separating them.

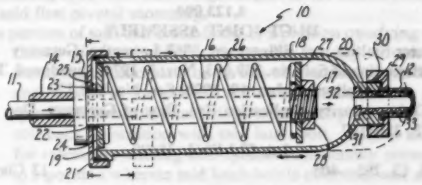
4,123,092

CONTRACTION RESISTANT COUPLING FOR PIPE LINES CARRYING GASES OR FLUIDS

Thomas E. Colbert, Jr., 150 Wood Valley La., Athens, Ga. 30601

Filed Sep. 8, 1976, Ser. No. 721,582
Int. Cl.[2] F16L *55/00*
U.S. Cl. 285—187 **4 Claims**

1. A temperature responsive coupling for two fluid carrying tubes comprising one tube having a low co-efficient of expansion and a second tube having a high co-efficient of expansion, said second tube having an enlarged hollow female end and said first tube having an extended male end to fit within said female end of said second tube, the open end of said enlarged hollow female end of said second tube provided with a closure disc having a circular aperture to encircle and slideably fit said first tube, seals provided between said disc and said first tube to insure a fluid tight relationship, said first tube provided with an enlarged end against which said disc may abut, said first tube provided with an extended portion having a threaded end, a circular plate to fit said first tube and abut with said closure element, a spring passed over said first tube to abut said circular plate and a disc fitted over the threaded end of said first tube to abut and compress said spring, a nut fitted to said threaded end of said first tube to hold said spring compressed, said second tube movable in expansion and contraction with changes in external temperature, said coupling allowing a full linear expansion of said second tube and an expected degree of contraction during changes of temperature surrounding said coupling and attached lines.

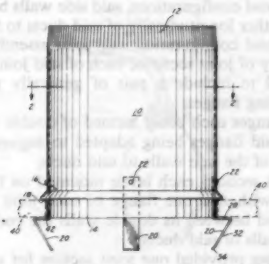


4,123,093

DUCTBOARD COLLAR

William M. Newland, Littleton, Colo., assignor to Hercules Supply Company, Denver, Colo.

Filed Oct. 31, 1977, Ser. No. 847,001
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—189 **1 Claim**



1. A fitting for connecting conduits to larger ducts, comprising:

(a) a short length of full diameter sheet metal conduit of the size and shape of the conduit to be connected to the duct, having means at one end for communicating assembly with a conduit, and having a full cross-section at the opposite end,

(b) externally directed bead means circumferentially formed in said sheet metal extending outwardly from the exterior of said short length conduit adjacent to and spaced from said full cross-section end, and said bead including a complete circumferential bearing surface for the wall of a duct,

(c) the length of the full cross-section end beyond said bead means being essentially a distance equal to the thickness of a wall of a duct, and

(d) a plurality of three or more spring clips means mounted on said short length of conduit at the full cross-section end arranged in general opposition to provide holding of said fitting to duct and arranged to compress permitting entry of the full cross-section end through a bore in the wall of a duct and to expand after such entry to bear against the interior of the wall of the duct to bias said bearing surface against the exterior of the wall of the duct around the bore therethrough, said spring means each including a flat

spring section secured to the inside of said short length of conduit and extending toward and beyond said full cross-section opening and a 90° portion extending outwardly from said opposite end in position to contact the inside of a duct board and hold said fitting in an opening in a duct board when expanded.

4,123,094

DUCT JOINT ASSEMBLY

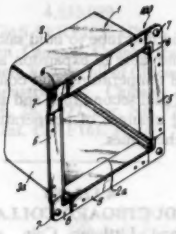
Günter Smitka, Am Bülzgraben, 5868 Letmathe, Germany

Continuation of Ser. No. 739,053, Nov. 5, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,720

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1975, 2556167

Int. Cl.² F16L *23/00*

U.S. Cl. 285—405 **13 Claims**



1. A joint assembly for connecting together at their ends a pair of ducts each consisting of sheet material forming side walls of said ducts, said ducts having congruent polygonal cross sectional configurations, said side walls being planar and joined together longitudinally of said ducts to form corners of said polygonal configuration, said joint assembly conprising:

a plurality of joint sections, each of said joint sections being formed to include a pair of generally perpendicularly extending flanges;

said flanges each being formed of double walls, with one of said flanges being adapted to engage therebetween one of the side walls to said ducts;

said joint sections each being mounted on the ends of said ducts with said one flange of each joint section having engaged between its double walls the end of one of said side walls of said ducts;

there being provided one joint section for each of the side walls of each of said ducts; and

a plurality of angle plates each including a corner region having a pair of arms extending from said corner region;

each of said angle plates being positioned within said joint assembly with each of said arms extending to between the double walls of the other of said flanges of said joint sections;

each of said angle plates being arranged so that its arms extend oppositely from said corner region into flanges of adjacent joint sections of one of said ducts;

said corner regions of each of said angle plates on one of said ducts being connected with a corner region of one of the angle plates on the other of said ducts, with each arm of each of said angle plates on one duct being brought into generally facing relationship across said joint assembly with an arm of an adjacent angle plate on the other of said ducts;

each pair of facing arms thus pressing therebetween one of the double walls of the flanges within which each said arms extend, each pair of arms therefore pressing therebetween two walls, one each from different flanges;

each of said arms of each of said angle plates being formed with a curved configuration which extends from said corner region outwardly therefrom to the end of each arm;

the curved configuration of said arms being oriented so that each of said pair of facing arms is arranged with the ends of each arm curving toward the end of the facing arm across the joint assembly to provide enhanced joinder pressure at the ends of each pair of arms, said curved configuration of the arms thus operating to form from each pair of facing arms individual pairs of pincers to enhance the joinder pressure by which said joint sections connect together said pair of ducts.

4,123,095

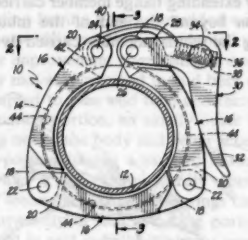
PIPE CLAMP HAVING AN OVERCENTER TOGGLE

Theodore A. Stehlin, Pasadena, Calif., assignor to Hansted Corporation, Carson City, Nev.

Filed Jun. 30, 1977, Ser. No. 811,783

Int. Cl.² F16L *23/00, 37/20*

U.S. Cl. 285—409 **1 Claim**



1. A clamping structure for use in holding adjacent, aligned, flanged pipe ends with respect to one another which comprises:

a band comprising a plurality of identical elongated clamping segments located in end-to-end relationship, said band having terminal ends,

each of said segments having a clamping surface comprising an internal groove which is curved throughout its length so as to correspond to the curvature of said flanged pipe ends and which has a cross-sectional configuration corresponding to the cross-sectional configuration of the exteriors of said flanges when said pipe ends are adjacent and aligned with one another, each of said clamping surfaces extending less than one hundred eighty degrees around the circumference of said pipe ends.

each of said segments having a single tongue extending from one end thereof and two spaced, parallel ears extending from the other end thereof, said tongues of said adjacent ends fitting between said ears at said adjacent ends,

a pivot means located so as to connect each pair of adjacent ends of said segments so that said segments can be pivoted relative to one another, said pivot means comprising pins extending between and connecting said ears and said tongues at said adjacent ends,

said band being of less length than the circumference of said flanged ends, and being of such dimension that said segments only engage the flanges on said pipe ends when located so that said grooves fit over said flanges on said pipe ends,

a locking arm pivotally mounted on one of said terminal ends, said locking arm including bifurcated ends,

a pin serving as a latch retainer located on the other of said terminal ends,

a latching element located on said locking arm, said latching element including a cylindrical member pivotally mounted on said bifurcated ends and a hook element, said cylindrical member having a threaded opening therein, said hook element including a rigid threaded base portion threaded within said opening in said cylindrical member, and a non-cylindrical elongated resilient section extending from the rigid base portion and having an inwardly bent hook adapted to engage said pin serving as a latch retainer,

said latch retainer, said latching element, and said locking arm form an overcenter toggle holding said locking arm in place when said clamping structure is in use.

4,123,096

LOCK FOR BIASING DOOR IN CLOSED POSITION

Pierre Ardizio, Rue de Saint-Jean 21, 1203-Geneva, Switzerland

Filed Apr. 25, 1977, Ser. No. 790,515

Claims priority, application Switzerland, Apr. 27, 1976, 5258/76; Apr. 12, 1977, 4490/77

Int. Cl.[2] E05C *3/24*

U.S. Cl. 292—216 **18 Claims**

1. A lock including at least two elements adapted to be hooked together, at least one element being movable and acting as a closing member, a second element acting as a retaining member, one of said elements mounted on a stationary frame and the other on a movable leaf, said lock comprising:

said closing member including an articulated hook operating as a pawl for hooking itself to said retaining member;

said retaining member including a lever articulated on a support and biased in a return direction by a return spring;

said hook mounted on a second support, said second support including a pushing member articulated thereon, said pushing member during the closing of said leaf acting against said retaining member opposite the return direction of said return spring to engage said retaining member on said pawl; and

release means to release said pushing member when said leaf is approximately in the closed position, the release of said pushing member releasing said retaining member which is then urged into the fully closed position by said return spring.

4,123,097

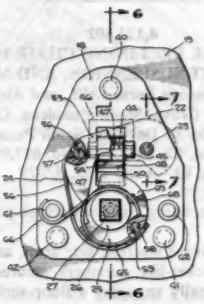
SECTIONAL ENTRANCE HANDLE RETRACT MECHANISM

James G. Allemann, Santa Ana, Calif., assignor to Norris Industries, Inc., South Gate, Calif.

Filed May 31, 1977, Ser. No. 802,043

Int. Cl.[2] E05B *1/16*

U.S. Cl. 292—336.3 **8 Claims**



1. A latch mechanism for a door in which a rectractable latch bolt is installed in the door, said latch mechanism comprising a mounting plate, a thumb piece having a contact portion thereon, said thumb piece having a pivotal mounting on the plate with the axis of rotation parallel to said plate for generating movement of said contact portion in a direction transverse relative to the axis of the pivotal mounting, a bell crank having a pivotal mounting on said plate on an axis of rotation spaced from and at right angles to the axis of rotation of said first pivotal mounting,

a portion of said bell crank being in a position overlying said thumb piece, a spindle subassembly having a rotatable mounting on said plate on an axis of rotation spaced from and parallel to the axis of rotation of said bell crank, said spindle subassembly including means adopted to have a roll back association with said latch bolt, resilient means for releasably holding said spindle subassembly normally in a position wherein said latch bolt is extended, and drive means between said bell crank and said spindle subassembly having one part attached to the bell crank at a location spaced the same distance from the axis of rotation of said bell crank in all positions of rotation of said bell crank and another part attached to the spindle subassembly at a location spaced the same distance from the axis of rotation of said spindle subassembly at all positions of rotation of said spindle subassembly.

4,123,098

CONTACT LENS INSERTION AND RETRACTION DEVICE

Leo E. Shoup, 125 N. Mt. Vernon, Prescott, Ariz. 86301

Filed Jul. 25, 1977, Ser. No. 818,435

Int. Cl.[2] A61F *9/00*

U.S. Cl. 294—1 CA **4 Claims**

1. A soft contact lens insertion and retraction device comprising, in combination, a flexible bulb member, a thin, angled, connecting tubular member having one end connected to said flexible bulb member, a soft contact lens holder portion connected to the other end of said connecting tubular member, said soft contact lens holder portion having a cup-shaped member located at one end thereof, said cup-shaped member having a semi-circular shaped cavity, and concave blocking means extending across said semi-circular shaped cavity for preventing a soft contact lens from being sucked down in the direction of said flexible bulb member,

said concave blocking means comprising a diagonally extending concave blocking member having a relatively large opening on each side thereof for permitting maximum flow of air pressure.

4,123,099

CLOSURE FOR TRUCK BED

Charles Mashigan, Redford, Mich., assignor to American Motors Corporation, Southfield, Mich.

Filed May 4, 1977, Ser. No. 793,584

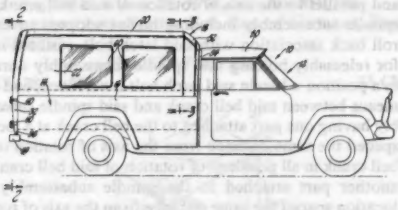
The portion of the term of this patent subsequent to Sep. 26, 1995, has been disclaimed.

Int. Cl.[2] B60P *3/42*

U.S. Cl. 296—10 **7 Claims**

1. A removable rear bed closure for a truck having laterally

spaced side walls extending upwardly from the bed behind a front cab, the bed side walls having rear ends including taillights supported thereby, said closure comprising: an upper roof portion positioned above the bed; closure side walls extending downwardly from the bed side walls to the roof portion; the closure side walls and roof portion having rear ends that cooperate with the bed to define a rear opening; means for detachably securing the closure to the bed; and said rear ends of the closure side walls having downwardly projecting hinge



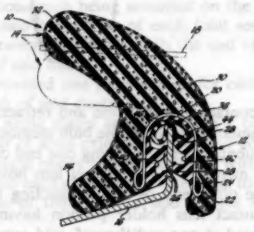
pillars located laterally inward from the taillights; said hinge pillars being located rearwardly of the bed side walls in longitudinal alignment therewith such that the rear opening has approximately the same lateral width as the bed; a pair of rear doors respectively supported by the hinge pillars for pivotal movement about vertical axes between open and closed positions with respect to the rear opening; and each door having an upper end that seals at the upper roof portion and a lower end that seals at the bed in the door closed position.

4,123,100

WEATHERSTRIP SEALING ARRANGEMENT

Jerry Ellis, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1977, Ser. No. 819,705
Int. Cl.[2] B60J 1/00
U.S. Cl. 296—93 **1 Claim**



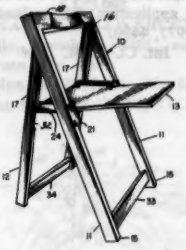
1. In a vehicular closure opening and a cooperating body flange, a weatherstrip comprising a molded retention member adapted to being mounted on the body flange and including equally spaced, laterally extending metal strips formed therein and crimped into a U-shaped configuration to form a recess having an end wall and a pair of oppositely disposed side walls, and having a predetermined width for receiving the body flange, and a pair of retention lips formed on each side wall of the U-shaped recess and extending toward the center of the recess to exert a pressure on the body flange to retain the weatherstrip in place thereon, and a flexible tubular member confined against and substantially uniformly depressed toward the end wall of the recess inward of the retention lips, said tubular member adapted to being further depressed toward the end wall of the recess along its entire length by the abutment of the body flange against the center portion thereof to thereby seal off the inside surface of the flange from the outside surface thereof.

4,123,101

FOLDING CHAIR

Lawrence D. Minsker, 102 Pleasant View Dr., Jamestown, N.Y. 14701

Continuation of Ser. No. 568,408, Apr. 16, 1975, abandoned.
This application Nov. 24, 1976, Ser. No. 744,655
Int. Cl.[2] A47C 4/00
U.S. Cl. 297—58 **1 Claim**



1. A wooden folding chair comprising front legs disposed in rigid spaced relation with each other and extending upwardly and rearwardly to form supports for a back member,

and rear legs pivotally connected within the upper portions of said front legs disposed in rigid spaced relation with each other,

a seat pivotally disposed within said front and rear legs and a first bracket and a second bracket disposed on each side of said seat,

said brackets each comprising a seat angle member and a front leg angle member,

said seat angle members and said front leg angle members each having a first flange disposed in a vertical plane and a second flange fixed to the first flange and generally perpendicular thereto,

said first flanges of said seat angle member and said front leg angle member being disposed in planes adjacent and parallel to each other,

pivot means connecting said first flange of each of said angle members together at the front portion of the seat angle members,

said first flanges of said seat angle members resting on said seat edges,

said second flanges of said front leg angle member fixed to the front edges of said front legs,

said seat flanges of said second angle members underlying said seat and being fixed thereto,

said rear legs each having a downwardly extending inwardly facing slot and a laterally extending pin means on the rear portions said first flanges of said seat angle members slidably receivable in said slots in said rear legs.

4,123,102

ADJUSTABLE RECLINING CHAIR HAVING THREE-POINT SUSPENSION, AND METHOD

Archie C. Landry, Canoga Park, Calif., and Alexander C. Daswick, 647 Orange Grove, South Pasadena, Calif. 91030, assignors to Alexander C. Daswick, South Pasadena, Calif.

Filed Jul. 22, 1977, Ser. No. 817,997
Int. Cl.[2] A47C 1/02, 3/029
U.S. Cl. 297—270 **9 Claims**

1. An adjustable reclining chair with three-point suspension, comprising:

a chair frame having a seatrest, side arms, and a backrest;

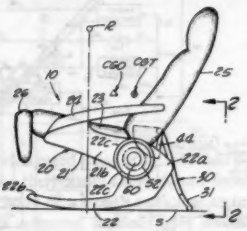
a pair of semi-rocker-like members secured beneath said frame and normally engaging a floor surface to provide two front points of support;

a rear support frame angled downwardly and having its forward and upward end pivotally attached to said chair frame along a horizontal axis near the rearward end of said

seatrest, the rearward and downward end thereof normally engaging the floor surface to effectively provide a single rear support point;

manually operable drive means, operable by the occupant while occupying the chair, for adjustably rotating said rear support frame relative to said chair frame to thereby adjust the angle of recline of said chair frame;

the chair being so constructed that in every position of said rear support frame both the center of gravity of the chair, and the composite center of gravity including the occupant when the chair is occupied, are at least about 3 inches rearwardly of said two front support points; and



said rear support frame being resiliently constructed to permit limited rocking of the chair and its occupant, said drive means including a drive shaft disposed to the rear of said seat rest, said chair frame also having side frame portions in which the respective ends of said drive shaft are journaled; the ends of said drive shaft extending through said side frame portions and having knobs attached thereto so that the chair occupant may operate said drive shaft with either hand; and further including drive gear means coupling said drive shaft to the upper and forward end of said rear support frame.

4,123,103

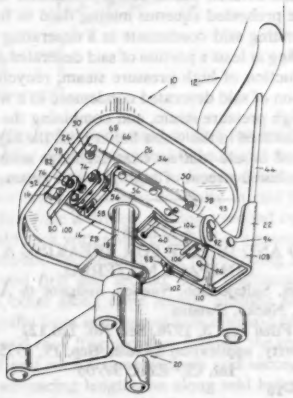
CHAIR CONTROL FOR A TILTABLE STENOGRAPHER'S CHAIR

Frank Doerner, 138 Aberdeen Rd., Kitchener, Ontario, Canada (N2M 2Y7)

Filed Apr. 4, 1977, Ser. No. 784,166

Int. Cl.[2] A47C *3/00*

U.S. Cl. 297—305 **4 Claims**



1. In a chair control for use with a tiltable stenographer's chair which comprises a fixed frame member mounted on a vertical post and attached to the undersurface of the seat of the chair, a movable frame member, the forward end of which is pivotally connected to said fixed frame member and with its opposite end adjustably connected to the seat back, a biasing means adapted to return said back of said chair to a resting position after said back has been depressed and released, wherein said movable frame member comprises an inverted substantially U-shaped horizontally aligned first bracket, the forward portion of which is pivotally connected to said fixed frame member, a substantially U-shaped horizontally aligned second bracket, the rearward portion of the arms of said first bracket and the forward portion of the arms of said second bracket overlapping and adjustably secured to each other, and a vertical bar, one end of which is adjustably secured to said second bracket and the other end secured to said seat back, said adjustable connection between said first and said second brackets of said movable frame member comprising a horizontal bolt extending through the arms of said first and said second brackets and a tightening means adapted to tighten and secure said first and said second brackets, the improvement comprising a downwardly depending rearward part of the top surface of said inverted substantially U-shaped first bracket which is located between the respective arms of said first and said second bracket around said horizontal bolt, said part adapted to resist the distortion of said first and said second brackets when said tightening means is tightened.

4,123,104

HEADREST FOR A MOTOR VEHICLE

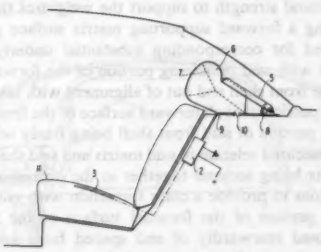
Rudolf Andres, Sindelfingen; Gerhard Busch, Gechingen, and Werner Heiss, Doffingen, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Sep. 1, 1977, Ser. No. 829,712

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640163

Int. Cl.[2] A47C *1/10*

U.S. Cl. 297—391 **9 Claims**



1. A headrest for a motor vehicle with an inflatable bellows means which is inflated only in case of need, comprising:

inflatable bellows means for forming the headrest itself;

means for inflating and deflating the bellows means; and

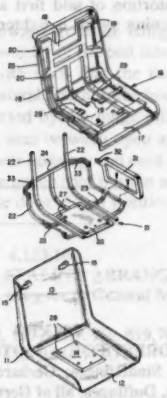
elastically yielding drawband means for operably returning the bellows means into its folded-together position in response to the deflating of the bellows means.

4,123,105

CHAIR CONSTRUCTION

Fred J. Frey, Michigan City; Stanley Hynek, Rolling Prairie, and Edward Losinski, Michigan City, all of Ind., assignors to InterRoyal Corporation, New York, N.Y.

Continuation of Ser. No. 626,810, Oct. 29, 1975, abandoned.
This application Feb. 16, 1977, Ser. No. 769,089
Int. Cl.[2] A47C *7/02*
U.S. Cl. 297—451 **10 Claims**



1. A chair or the like comprising:

a front contoured shell having seat and back portions, said shell being provided with a forward surface having the predominant portion thereof disposed rearwardly of the remaining portion of such front surface;

a rear contoured shell having seat and back portions;

an independent intermediate load bearing matrix of sufficient structural strength to support the weight of the user and having a forward supporting matrix surface portion arranged for corresponding substantial underlying alignment with said remaining portion of the forward surface of the front shell and out of alignment with said predominant portion of such forward surface of the front shell, the back portion of said front shell being freely self-disposed in unsecured relation to said matrix and said shells and said matrix being secured together at the corresponding seat portions to provide a chair formation with said predominant portion of the forward surface of the front shell disposed rearwardly of and spaced from said forward supporting surface portion of the matrix, and said front and rear shells individually and together being of insufficient structural strength to support the weight of the user in the absence of the independent intermediate matrix.

4,123,106

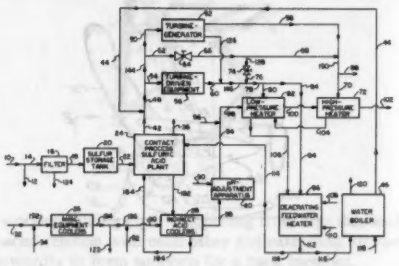
Patent Not Issued For This Number

4,123,107

INTEGRATED SULFUR MINING - SULFURIC ACID PRODUCTION SYSTEM

Raymond G. Bryant, Jr., and Clifford M. Cockrell, both of New Orleans, La., assignors to Freeport Minerals Company, New York, N.Y.

Filed Feb. 3, 1977, Ser. No. 765,236
Int. Cl.[2] E21B *43/28*; E21C *41/14*
U.S. Cl. 299—6 **9 Claims**



1. An integrated sulfur mining and sulfuric acid manufacturing process which comprises injecting a superheated aqueous mining fluid which is above the melting point of sulfur into an underground sulfur formation to obtain mined sulfur in the molten state, oxidizing said molten sulfur to produce sulfur dioxide, catalytically converting said sulfur dioxide to sulfur trioxide, absorbing said sulfur trioxide in diluted sulfuric acid to obtain an acid of predetermined strength, preheating the aqueous mining fluid by indirect heat exchange with said acid of predetermined strength, producing high pressure steam from deaerated water by indirect heat exchange with the gases from both the oxidation of the molten sulfur to sulfur dioxide and the catalytic conversion of said sulfur dioxide, generating electrical and mechanical energy with at least a portion of said high pressure steam, heating the preheated aqueous mining fluid to obtain said superheated aqueous mining fluid by indirect heat exchange with the exhaust steam from said energy generation, said exhaust steam being condensed during said heating of the preheated aqueous mining fluid to form a condensate, deaerating said condensate in a deaerating feedwater heater, recycling at least a portion of said deaerated condensate for said production of high pressure steam, recycling the remaining portion of said deaerated condensate to a water boiler to produce high pressure steam, and combining the high pressure steam produced in the water boiler with the high pressure steam produced in said indirect heat exchange with said gases to form a combined stream of high pressure steam.

4,123,108

METHOD AND DEVICE FOR BREAKING A HARD COMPACT MATERIAL

Erik V. Lavon, Saltsjo-Boo, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

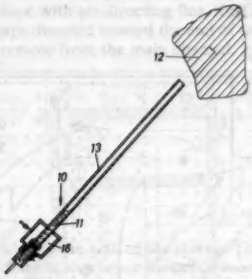
Filed Sep. 3, 1976, Ser. No. 720,122
Claims priority, application Sweden, Sep. 19, 1975, 7510559
Int. Cl.[2] E21C *37/06*
U.S. Cl. 299—16 **23 Claims**

1. A method of breaking a hard compact material, such as rock, comprising:

mechanically pre-drilling at least one substantially cylindrical blind hole in the material to be broken, said material having free surfaces adjacent said hole,

accelerating an elongated mass body of substantially incom-

pressible fluid to an impact velocity sufficient to cause cracks to form in the material, the smallest cross sectional dimension of said elongated mass body being at least 70% of the free cross sectional diameter of said hole, and



directing said elongated mass body into said pre-drilled hole for impacting the bottom thereof, and forming said elongated mass body of a length sufficient to break the material towards adjacent free surfaces of the material by means of the momentum of said elongated mass body.

4,123,109

MINING METHOD

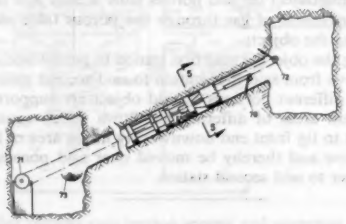
Bruce S. Hill, Mondeor, South Africa, assignor to Edenvale Engineering Works (Proprietary) Limited, Johannesburg, South Africa

Filed Oct. 14, 1976, Ser. No. 732,198

Claims priority, application South Africa, Oct. 28, 1975, 75/6817

Int. Cl.² E21C *27/20*

U.S. Cl. 299—18 **1 Claim**



1. A method of underground mining for producing a series of overlapping empty cylindrical holes in side-by-side relationship, comprising drilling a first cylindrical hole through rock with a core drill that rotates coaxially in said first hole, and after said first hole is drilled, drilling a second cylindrical hole through said rock with a said core drill in a manner to produce rock fragments, said second hole overlapping said first hole whereby said first and second holes communicate laterally with each other along their length, pushing said rock fragments laterally from said second hole into said first hole immediately as said rock fragments are formed, the region of lateral transfer of said rock fragments from said second hole to said first hole advancing lengthwise along said holes in the direction of drilling of said second hole and immediately behind the advancing bottom of said second hole, passing conveyor means along said first hole with no drilling means in said first hole while drilling said second hole thereby to remove substantially all said rock fragments from said first hole, and repeating the method with third and subsequent holes.

4,123,110

AUXILIARY DEVICE FOR A MINING MACHINE

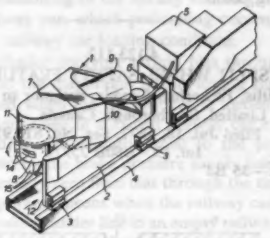
George A. Parrott, Wakefield, and John B. Norris, Leeds, both of Great Britain, assignors to Dresser Europe S.A., Brussels, Belgium

Filed Jun. 16, 1977, Ser. No. 807,305

Claims priority, application United Kingdom, Jun. 16, 1976, 24980/76

Int. Cl.² E21C *35/20*

U.S. Cl. 299—43 **10 Claims**



1. An auxiliary device adapted to be connected to a conveyor mounted, longwall mining machine, the auxiliary device comprising an underframe adapted for mounting on and travel along the conveyor of the mining machine, a rotary breaking element drivably carried by the underframe, and reaction means on the underframe against which material may be impacted by said rotary beaking element, the reaction means being spaced laterally, with respect to the direction of travel of the auxiliary device, from an adjacent periphery of the rotary element so as to define between the rotary element and the reaction means a material breaking gap, whereby, in use, material on the conveyor entering the material breaking gap is broken against the reaction means by the rotary element as the latter rotates.

4,123,111

SNAP-IN CONNECTION, ESPECIALLY COVER FOR WHEELS OF PASSENGER MOTOR VEHICLES

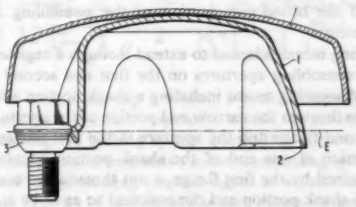
Udo D. Renz, Rechberghausen, and Dieter Memmhardt, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Sep. 23, 1976, Ser. No. 725,725

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2542973

Int. Cl.² B60B *7/06*

U.S. Cl. 301—37 TP **5 Claims**



1. A snap-in cover cap adapted to be fastened by a force fit to a plurality of cap-retaining detents, said cover cap being formed of elastically deformable material and having an uninterrupted peripheral edge with first portions of a first configuration, said peripheral edge being further provided with a plurality of detent engaging recesses therein of a second configuration, said recesses forming slots which open axially and radially outwardly for receiving said detents and being alter-

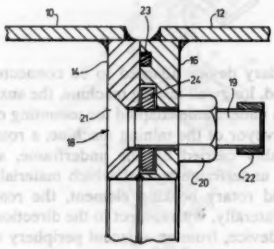
nately arranged with said first portions about said peripheral edge and having edge portions of a shape engageable from the inside toward the outside underneath said cap-retaining detents in an installed position and forming detent engaging points, said first configuration being dimensioned radially outwardly with respect to the engaging points of said second configuration a distance producing a lever arm between said first portions and connecting lines between adjacent detent engaging points which is sufficient for reducing the force required to achieve a predetermined compression of said cap at said engaging points while maintaining a satisfactory gripping force at said engaging points.

4,123,112

SPLIT WHEEL SAFETY FEATURE

Peter M. Mills, Pickering, Canada, assignor to Titan Proform Company Limited, Scarborough, Canada

Filed Jul. 18, 1977, Ser. No. 816,910
Int. Cl.[2] B60B *25/16*
U.S. Cl. 301—35 BJ **7 Claims**



1. A wheel for a pneumatic tire, said wheel comprising a first rim portion and a second rim portion, each rim portion having a respective radially inwardly extending flange at one axial end thereof, the flanges being adapted to be releasably secured together in the assembled wheel;

the first and second flanges having respective series of circumferentially spaced assembling apertures therein adapted to register with one another;

the assembling apertures on the second flange each comprising a circumferentially extending slot having a narrow end portion and a broad end portion communicating therewith, the narrow end portion thereof being at least partially bounded by a depression on the surface of the second flange which is presented towards the first flange in the assembled wheel, the side walls of said depression constituting an axially extending formation of the second flange at a position intermediate the narrow end portion and the broad end portion of the assembling aperture therein;

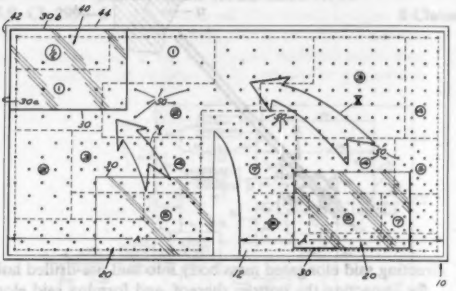
securing means adapted to extend through a registered pair of assembling apertures on the first and second flanges, said securing means including a shank portion adapted to pass through the narrow end portion of the aperture in the second flange and the aperture in the first flange, a head portion at one end of the shank portion adapted to be retained by the first flange, a nut threadably received on the shank portion and dimensioned so as to be engagable against side walls defining the narrow end portion of the aperture in the second flange but to pass through the broad end portion thereof, and an enlarged member on the shank portion between the nut and the head portion thereof, engagable against side walls defining the narrow end portion of the aperture in the second flange and adapted to be retained by said axially extending formation thereon against circumferential displacement relative to the flange when the nut is tightened.

4,123,113

GAS TABLE

George A. Koss, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 26, 1977, Ser. No. 836,623
Int. Cl.[2] B65G *51/02*
U.S. Cl. 302—2 R **12 Claims**



1. A method of moving an object which is floatable on a cushion of gas from a first station to a second station, which method comprises the steps of:

establishing a plurality of zones of gas flow by passing a gas upwardly through a porous table member, the amount of gas flow in each said zone being controlled by the porosity of said zone of said table member, the greater the porosity of said zone, the greater the amount of gas flow in said zone;

locating said zones of said porous table member in such a location that on a path of travel in a direction from said first station to said second station the amount of gas flow in the zones is generally reduced, provided, however, that many of said zones are contiguous and of the same gas flow to define a larger area, said larger area being smaller in size than the object to be moved;

flowing a gas through said porous table member to float the object to be moved thereover;

placing the object on said porous table at said first station, the movement of gas through the porous table member floating the object;

releasing the object at said first station to permit said object to move from said first station to said second station because different portions of said object are supported by different areas of differing gas flows which causes the object to tip front end downwardly in the area of lowest gas flow and thereby be moved over said porous table member to said second station.

4,123,114

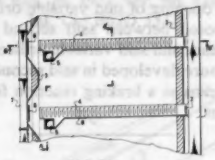
ARRANGEMENT FOR THE PNEUMATIC REMOVAL OF BULK PARTICULATE MATERIAL FROM THE FLOOR OF A STORAGE PLACE

Stanislav Rataj, Rudolfov; Karel Krch, Plana nad Luznici; Josef Pilousek, Lhota pod Horami; Jaroslav Blazek, Kosice u Tabora; Hynek Vitek, Podoli u Tabora, and Ladislav Macek, Tabor, all of Czechoslovakia, assignors to Zemedelsky nakupni a zasobovaci podnik narodni podnik, Ceske Budejovice, Czechoslovakia

Filed Mar. 9, 1977, Ser. No. 775,783
Int. Cl.[2] B65G *53/40*
U.S. Cl. 302—53 **3 Claims**

1. An arrangement for the pneumatic removal of air-floatable bulk particulate material from the floor of a multiple-sided walled storage place having first and second opposite walls spaced from each other, comprising a main air channel along said first side wall of the storage place, a source of pressure air connected to said main air channel, a number of material-floating and conveying channels extending substantially from the first to the second wall and having the ends thereof at the first

wall connected to said main channel, the material-floating and conveying channels being distributed over the area of the floor of the storage place, air closures disposed between the main channel and the first ends of the individual material-floating channels adjacent the main channel, the material-floating channels being provided in the parts thereof engaging the material in a storage place with air-directing fins, the fins providing air discharging gaps directed toward the end of the material-floating channels remote from the main channel, gates for the bulk



material provided in the wall of the storage place remote from the main air channel, conveyor means outwardly of the gates adapted to receive and forward material delivered thereto through the gates, an additional distribution channel for pressure air along the second side wall of the storage place, a source of pressure air for said additional distribution channel, and air closures and conduits connecting the additional distribution channel with the second ends of the individual material-floating and conveying channels.

4,123,115

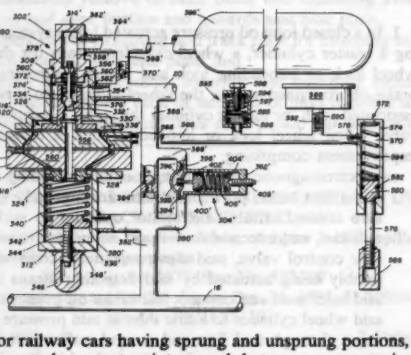
BRAKE CONTROL METHOD AND APPARATUS FOR RAILWAY CARS

William R. King, 1909 Sunshine Sq., Longview, Tex. 75601

Continuation-in-part of Ser. No. 775,379, Mar. 7, 1977. This application Oct. 18, 1977, Ser. No. 843,285

Int. Cl.[2] B60T *8/18*

U.S. Cl. 303—22 R **37 Claims**



1. For railway cars having sprung and unsprung portions, a brake control apparatus interposed between a pressurized brake pressure supply line connected to a train brake valve and a pressurized brake cylinder line connected to the brakes of the railway car for transmitting a pressure drop signal received from the train brake valve to the brakes, which comprises:

structure defining a first chamber with a port connected to the brake pressure supply line for receiving the pressure drop signal from the train brake valve;

structure defining a second chamber with a port connected to the brake cylinder line for transmitting a predetermined pressure drop signal to the brakes;

first check valve means positioned between the brake pressure supply line and the brake cylinder line for connecting the first and second chambers when the pressure in the first chamber exceeds the pressure in the second chamber until the pressures in the brake pressure supply line and in the brake cylinder line equalize to effect brake release;

diaphragm means movably abutting said first and second chambers with surfaces of different areas;

first normally closed valve means mounted on the diaphragm means and responsive to predetermined positioning thereof for permitting fluid flow through the diaphragm means between the first and second chambers upon a pressure drop in the brake pressure supply line effected by the train brake valve until the diaphragm means regains equilibrium;

means for applying a predetermined bias to the diaphragm means urging the first valve means closed;

structure defining a third chamber with a port and abutted by at least part of the diaphragm means; and

strut cylinder means including a port connected to the port of the third chamber and an extending strut responsive to relative positioning of the sprung and unsprung portions of the railway car, which positioning corresponds to the particular railway car loading condition;

said strut cylinder applying a fluid bias through the third chamber to the diaphragm means urging the first valve means open when the railway car is loaded so that the brake cylinder line in a loaded railway car experiences a pressure drop substantially equal to the pressure drop experienced by the brake pressure supply line, and applying substantially zero fluid bias through the third chamber to the diaphragm means when the railway car is empty so that the brake cylinder line in an empty railway car experiences a pressure drop relatively smaller than the pressure drop experienced by the brake pressure supply line by the inverse ratio of the diaphragm means surface areas abutting the second and first chambers, respectively.

4,123,116

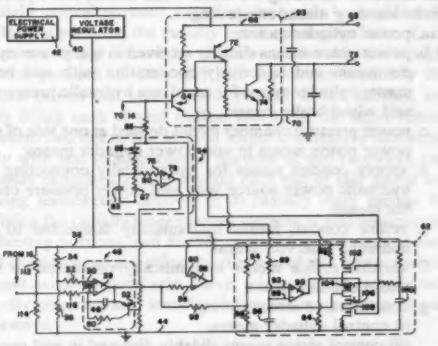
DUTY CYCLE TRANSLATOR WITH SOLENOID MODELING CIRCUIT FOR ADAPTIVE BRAKING SYSTEM

Ralph W. Carp; Leoncio T. Ang, both of Newport News, Va., and Guy T. Rini, North Ridgeville, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Jun. 16, 1977, Ser. No. 807,285

Int. Cl.[2] B60T *8/00*

U.S. Cl. 303—103 **19 Claims**



1. In a vehicle having a wheel, a brake controlling said wheel, and fluid pressure responsive means for actuating said brake, an adaptive braking system controlling communication to said fluid pressure responsive means comprising speed sensing means for generating a speed signal as a function of the rotational velocity of said vehicle wheel, means for generating a brake pressure control signal, and modulator means including electrically actuated valve means responsive to the brake pressure control signal for controlling communication to the fluid pressure responsive means, said brake pressure control signal generating means including means for modeling the response time of the electrically actuated valve means, means responsive to said speed signal for generating a pressure command signal, means for generating a feedback signal as a function of the response time of said electrically actuated valve means mod-

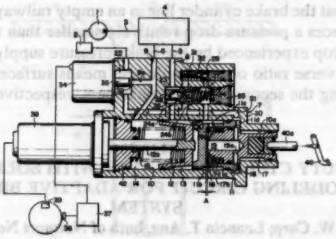
eled by said modeling means, and means for comparing the feedback signal with the pressure command signal to generate said control signal when the feedback signal and the pressure command signal are in a predetermined relationship with one another, said modeling means including circuit means responsive to transmission of said control signal to said electrically actuated valve means to generate a modeled signal representing the current in said electrically actuated valve means, means for comparing said modeled signal with a reference signal to generate an output signal, and means responsive to said output signal for generating said feedback signal.

4,123,117

HYDRAULIC ROOSTING MEANS

Yoshiharu Adachi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 572,390, Apr. 28, 1975, abandoned.
This application Oct. 25, 1977, Ser. No. 845,308
Claims priority, application Japan, May 4, 1974, 49-50427; May 7, 1974, 49-49686
Int. Cl.² B60T *13/12*
U.S. Cl. 303—114 **6 Claims**



1. Hydraulic brake boosting means for a braking system having brake pedal means, a hydraulic power source, hydraulic reservoir means, wheel brake means and brake master cylinder means for actuating the wheel brake means, said hydraulic brake boosting means comprising:

a. power cylinder means;

b. power piston means slidably received in said power cylinder means and selectively cooperation with said brake master cylinder means for supplying hydraulic pressure to said wheel brake means;

c. power pressure chamber means defined at one side of said power piston means in said power cylinder means;

d. supply conduit means for hydraulically connecting the hydraulic power source with said power pressure chamber means;

e. return conduit means hydraulically connected to the hydraulic reservoir means;

f. variable orifice means hydraulically connected to said return conduit means;

g. control valve means having

(i) control cylinder means;

(ii) control piston means slidably disposed in said control cylinder means for defining at one side therein a first control pressure chamber means opening into said supply conduit means and a second control pressure chamber means at the other side hydraulically and continuously connected to said variable orifice means;

(iii) channel means formed in said control piston means and having an orifice with access to said supply conduit means for diverting a portion of the hydraulic pressure from said hydraulic power source and for connecting, and establishing a pressure differential between said first and second control pressure chamber means;

(iv) by-pass port means provided in said control cylinder means and in direct fluid communication with said return conduit means at all times, wherein said by-pass port means is open to said first control pressure chamber means when said control piston means is displaced toward said second control pressure chamber means by a predetermined distance and wherein said by-pass port means is closed to said first control pressure chamber means when said control piston means is displaced toward said first control pressure chamber means; and

(v) means for resiliently biasing said control piston means toward said first control pressure chamber means;

h. manually operated means, including input piston means operatively connected to said brake pedal means for controlling the opening of said variable orifice means; and

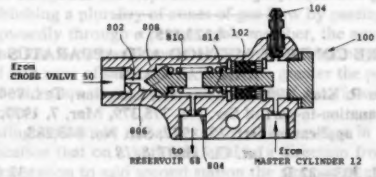
i. means disposed between said second control pressure chamber means and said variable orifice means for applying the pressure developed in said second control pressure chamber means as a braking reaction force to said input piston means.

4,123,118

ANTILOCK BRAKE CONTROL SYSTEM FOR A MOTORCYCLE FRONT WHEEL

Takefumi Sato, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1977, Ser. No. 756,834
Int. Cl.² B60T *8/06*
U.S. Cl. 303—119 **5 Claims**



1. In a closed loop oil pressure actuated brake system including a master cylinder, a wheel cylinder, means for detecting wheel lock or impending lock and means for returning the brake oil contained within the wheel cylinder to a reservoir associated with the master cylinder through a pressure control valve when wheel lock or impending lock is detected, the improvement comprising:

an electromagnetic cross valve assembly including an inlet and a first outlet port for communicating brake oil pressure created within said master cylinder to said wheel cylinder, and a second outlet port connected to said pressure control valve, said electromagnetic cross valve assembly being actuated by said detecting means to close said inlet port and connect the brake oil pressure within said wheel cylinder to a first inlet in said pressure control valve through said first and second outlet ports of said electromagnetic cross valve when wheel lock or impending lock is detected;

said pressure control valve including a reciprocable valve element therein which is responsive to said brake oil pressure within said wheel cylinder supplied to said first inlet in said pressure control valve on one side of said valve element and also being responsive to said brake oil pressure created within said master cylinder which is supplied to a second inlet in said pressure control valve on the other side of said valve element which is always in direct communication with the brake oil from said master cylinder;

a seal means positioned adjacent said reciprocable valve element for isolating the brake oil from said wheel cylinder from the brake oil from said master cylinder;

said pressure control valve including an outlet for returning the brake oil from said wheel cylinder to said reservoir associated with said master cylinder only when a force created by said brake oil pressure from said wheel cylinder acting on said one side of said reciprocable valve

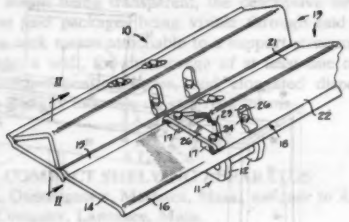
element is greater than a foce created by the brake oil pressure acting on said other side of said reciprocable valve element from said master cylinder.

4,123,119

TRACK SHOE WITH CLAMPING MEANS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 26, 1977, Ser. No. 828,004
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—39 **25 Claims**



1. An endless track assembly for a track-type vehicle comprising

an articulated link assembly including a plurality of pivotally interconnected links,

a track shoe releasably connected to each pair of laterally spaced links of said link assembly comprising

a base plate disposed on each said pair of said links,

a track plate disposed on said base plate and comprising an apex portion and a pair of sidewalls disposed in diverging relationship relative to each other and extending away from said apex portion and towards said base plate,

clamping means straddling said track plate for clamping said track plate to said base plate, and

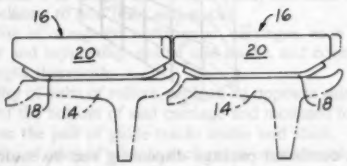
fastening means releasably securing said clamping means, said base plate and each of said pair of links together for releasably securing said track shoe to said link assembly.

4,123,120

NOISE REDUCING DEVICE IN UNDERCARRIAGE OF TRACK-TYPE VEHICLE

Yoshimasa Kohriyama, Tsukui, Japan, assignor to Caterpillar Mitsubishi Ltd., Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,207
Claims priority, application Japan, Sep. 13, 1976, 51-109554
Int. Cl.[2] B62D *55/20*
U.S. Cl. 305—41 **2 Claims**



1. A noise reducing device in an undercarriage of a track-type vehicle, comprising:

a pivotally linked chain of relatively movable track shoes;

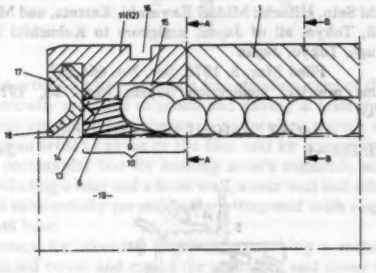
resilient means for biasing each shoe out of contact with its immediately adjacent shoe, said means being connected to each shoe and including a plate spring and an elastomer connected to each plate spring, each plate spring encompassing opposite ends of its associated elastomer, and each plate spring being deflected in abutting engagement with an immediately adjacent plate spring.

4,123,121

BALL BEARING ASSEMBLY WITH PLURALITY OF BALL GUIDEWAYS

Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Industrial Trading & Development Company B.V., Nieuwegein, Netherlands

Filed Dec. 14, 1976, Ser. No. 750,421
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1975, 2557351
Int. Cl.[2] F16C *31/06*
U.S. Cl. 308—6 C **13 Claims**



1. In a ball bearing for linear motion having an outer sleeve with a bore, a retainer within said bore, said retainer and bore defining a plurality of endless raceways each having a pair of straight central portions joined at their ends by semicircular deflecting portions, the radially outer running surfaces of said raceways being defined by said bore, whereby the straight central portions of each said pair are circumferentially displaced in said ball bearing with respect to one another, and balls filling each of said endless raceways; the improvement wherein said sleeve has an axial length coextensive substantial only with said straight central portions of said raceways, said retainer extending axially beyond each end of said sleeve and having semicircular grooves in its radially outer surface for defining the radially inner running surfaces of said semicircular deflecting portions, and further comprising end rings at each end of said sleeve and affixed to the ends of said retainer which extend axially beyond said sleeve, said end rings radially outwardly covering said semicircular deflecting portions of said raceways.

4,123,122

BEARING ELEMENT

Alan L. Gabrielson, Bristol, and Harry Magazian, Monroe, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Jul. 6, 1976, Ser. No. 702,953
Int. Cl.[2] F16C *32/00*
U.S. Cl. 308—238 **12 Claims**

1. A bearing element consisting of a bearing substrate having a low-friction slide surface layer, said layer comprising: a porous coating metallurgically spray-bonded to the substrate

surface, and having interstices, such as craters and undercuts, and an adhesive-solid lubricant formulation applied over the

coating, at least a portion of the adhesive-solid lubricant formulation at least partially filling the coating interstices.

4,123,123

METHOD AND APPARATUS FOR FIXING GLOVE TO GLOVE BOX AND GLOVE SUITABLE THEREFOR

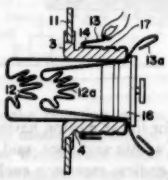
Shunichi Sato, Hitachi; Midori Kawasaki, Katsuta, and Mamoru Kunii, Tokyo, all of Japan, assignors to Kubushiki Kaisha Kokugo, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,357

Claims priority, application Japan, Mar. 28, 1975, 50-41631[U]

Int. Cl.[2] A61G *11/00*; A41D *27/10*

U.S. Cl. 312—1 **3 Claims**



1. A glove to be attached to a glove box which has a tube opening extending outside said glove box for access thereinto, said glove comprising:

a glove body fitted through said tube opening and having a main portion fitted around the outside of said tube opening;

fixing ring means integrally formed with and surrounding said main portion of said glove body for securing said main portion of said glove body to said tube opening;

said glove body further having an extended fin portion integrally formed with and extending from said main portion, said fin portion extending around and covering said fixing ring means and overlapping said main portion; and

a clamping ring means fitted around the outside of said extended fin portion overlapped against main portion, whereby said glove body is secured to said tube opening by both said fixing ring means and said clamping ring means.

4,123,124

CONVERTIBLE SEWING MACHINE CABINET

Robert S. Peets, Watchung, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jul. 7, 1977, Ser. No. 813,567

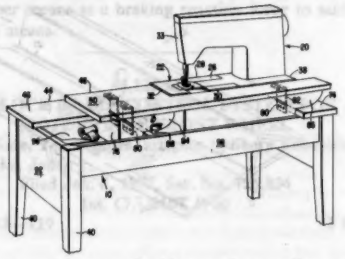
Int. Cl.[2] A47B *81/00*

U.S. Cl. 312—21 **3 Claims**

1. A cabinet for a sewing machine having a work supporting bed formed with a rear laterally disposed edge, a front laterally disposed edge, and first and second longitudinal edges joining said laterally disposed edges, said work supporting bed being convertible from a flat bed configuration to a cylinder bed configuration, said cabinet comprising:

a rear, laterally elongate, cabinet portion having a rear supporting surface;

means for pivotally supporting said sewing machine in a first position with said sewing machine retracted from view and in a second position with said rear laterally disposed edge of said work supporting bed adjacent to and forwardly of said rear cabinet portion, with said first longitudinal edge forwardly of said rear cabinet portion, and with said work supporting bed spaced above said rear work supporting surface; and



a vertically shiftable front, laterally elongate, cabinet portion having a front work supporting surface, said shiftable front cabinet portion, when in a lowered position, being located forwardly of and contiguous to said rear cabinet portion laterally beyond said sewing machine first longitudinal edge to the lateral end of said rear cabinet portion, said front work supporting surface being coplanar with said rear work supporting surface whereby said work supporting bed is spaced above said work supporting surfaces of both said rear and front cabinet portions.

4,123,125

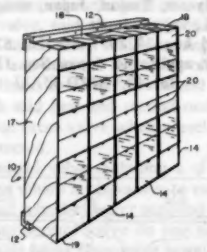
COMBINED DISPENSING AND INVENTORY CONTROL SYSTEM

Paul L. Andry, III, 2806 Soniat St., New Orleans, La. 70115

Filed Oct. 28, 1976, Ser. No. 736,455

Int. Cl.[2] A47F *1/00*; B65D *73/00*

U.S. Cl. 312—35 **3 Claims**



1. A combined package dispensing and inventory control system for packages having descriptive information on their exterior, for example, surgical suture packages, comprising:

a. at least one, elongated dispensing box each forming means for holding the packages having descriptive information thereon at the front of said box, each said box being provided with top, bottom, back and side walls but having an open front portion, each of said boxes being further provided with a plurality of inner shelf supporters on its walls; said dispensing box having a cross-sectional dimension which will allow for the stacking vertically within the said dispensing box a plurality of, for example, con-

ventional surgical suture packages, said packages having written information thereon;

b. a plurality of shelves horizontally mountable on at least some of the inner shelf supporters of said boxes;

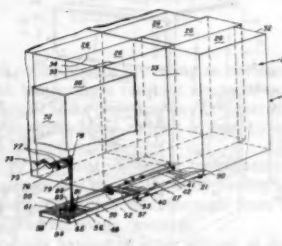
c. at least one panel means removably attachable to the front portion of each of said boxes, said panel means providing a writing surface thereon, said panel means dimensioned and so attachable to said box between two of said shelves as to provide an inlet above said panel and below a first, upper one of said shelves for the addition of, for example, surgical suture packages, to said box and an outlet below said panel and above a second, lower one of said shelves for the removal of said packages from said box; and said panel means being transparent, the descriptive information on said packages being visible through said panel means; rack means attachable to a support structure, for example, a wall, for the storage of at least one of said elongated dispensing boxes, said elongated dispensing boxes laterally movable on said rack means.

4,123,126

COMPACT SHELVING APPARATUS

Norman A. Querengasser, Methuen, Mass., assignor to Andrew Wilson Company, Lawrence, Mass.

Filed Aug. 4, 1977, Ser. No. 821,700
Int. Cl.[2] A47B *53/00, 87/00*
U.S. Cl. 312—201 **9 Claims**



1. Compact shelving of the type having a cluster of identical, elongated upstanding stacks of shelves, normally juxtaposed to each other side-by-side, said stacks being movable horizontally relative to a floor for separation from each other to gain access to the shelves on each opposite side of an individual said stack, said compact shelving characterized by:

each said stack being formed of a plurality of open shelves supported on each opposite side of a central, upstanding rectangular frame;

a plurality of pairs of elongated parallel, guide tracks set apart a predetermined space, each extending longitudinally under one of said stacks from back to front, each coextensive in length with a said stack; and each stationary relative to said floor and stack;

a plurality of elongated, rectangular, carriages, each affixed under and supporting, one of said stacks, and coextensive in length therewith;

a plurality of pairs of rollers, each on an opposite side of the rear of the bottom of said carriage and mounted for rotation on the pair of guide tracks under said stack,

a plurality of pairs of wheels, each on an opposite side of the front of the bottom of each said carriage normally mounted in said space between said tracks for rotation on said floor,

any of said juxtaposed stacks being movable longitudinally as an integral unit in an endwise direction from back to front and return on said wheels and on said rollers on said tracks, out of said cluster to expose the shelves on each opposite side thereof,

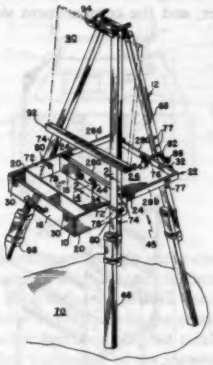
and mechanical advantage handle means on the front end of each said stack for enabling manual endwise movement thereof.

4,123,127

ARTIST'S KIT

Thomas E. Ford, 150-24 6th Ave., Whitestone, N.Y. 11354

Filed Apr. 20, 1977, Ser. No. 789,115
Int. Cl.[2] A47B *27/00*
U.S. Cl. 312—230 **12 Claims**



1. An artist's kit for use with a free standing easel of the type commercially available to artists and having at least three leg members configured to rest on a given plane during use for holding an artist's canvas or the like, said kit comprising;

a. a rectangular box for holding artist's materials, said box including a base and a front wall, a rear wall and side walls all substantially perpendicularly disposed with respect to said base;

b. means for covering said box comprising a rectangular shaped cover and means for mounting said cover to said box for pivotal movement between a closed position wherein said cover overlays the walls of said box and a fully opened position wherein said cover is disposed in a plane substantially parallel to the base of said box;

c. means for releasably locking said cover in said fully opened position to define an open top and rigid tray assembly, the releasable locking means including at least one locking member having portions connectable to at least one of one wall of said box and said cover; and

d. means for releasably connecting the rigid tray assembly between the leg members of the easel in a plane substantially parallel to the given plane for supporting the artist's materials during use.

4,123,128

PORTABLE PIE CASE

Carl L. Abele, 4863 Rainier Ave. South, Seattle, Wash. 98118

Filed Sep. 3, 1976, Ser. No. 720,259
Int. Cl.[2] A47F *3/00*
U.S. Cl. 312—244 **11 Claims**

1. A portable pie case for receiving and carrying a plurality of pies spaced vertically apart, each pie being disposed in a pie pan having a dish body and a peripheral lip, comprising:

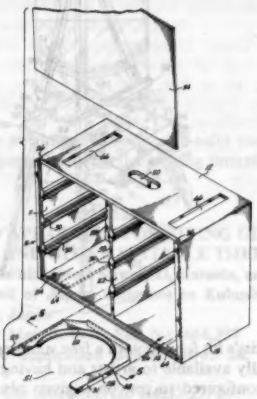
a housing having top, bottom, side and rear walls, together defining at least one pie receiving compartment;

a plurality of removable pie shelves, wherein each shelf comprises a relatively thin sheet member having a pie receiving opening therein sized to receive at least a portion of the body of said pie pan, a central open space at its front to provide a hand passage for facilitating placement and removal of a pie, a support portion bordering said opening and extending about said pie pan a substantial distance to both adequately support the weight of a pie and to restrain said pie against sliding movement in any direction, if subject to inertial forces during the transporting of said pie case, and a peripheral border portion;

wherein a substantial part of both said peripheral border

portion and said support portion are flanged at a downward angle with respect to the shelf proper for the purpose of increasing the strength and rigidity of said removable shelf;

wherein said peripheral border portions of each shelf are flanged at an angle of less than 90° with respect to the shelf proper, and the compartment side walls include a



plurality of opposed slideways which are disposed at the same downward angle and which are adapted to receive and hold said removable pie shelves in a vertically spaced configuration, whereby positioning of said removable shelves within the pairs of opposed slideways locks the side walls together, thereby enhancing the lateral bracing and strength of said housing.

4,123,129

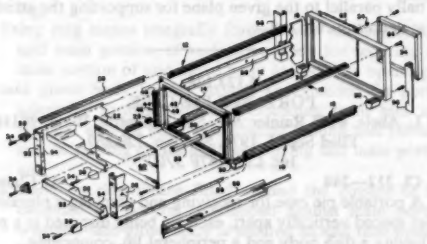
MODULAR ELECTRONIC INSTRUMENT CABINETS

Marlow Dole Butler, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Nov. 18, 1976, Ser. No. 743,016

Int. Cl.[2] A47B *43/00*

U.S. Cl. 312—257 R **6 Claims**



1. A modular electronic cabinet, comprising:

first and second panel members;

supporting members extending between said first and second panel members at the corners thereof, each of said supporting members having a pair of first grooves being respectively disposed in alignment with the respective first grooves of the respective supporting members, each of said supporting members having a pair of second grooves and a third groove provided between said pair of first grooves;

securing means extending through said panel members and in engagement with respective ones of said third groove thereby securing said panel members to said supporting members whereby frame means is formed;

strip means having edges matable with said second grooves of said supporting members; and

closure members having edges thereof slidably positioned along the aligned first grooves of said supporting members thereby enclosing said frame means;

wherein said strip means is a trim strip and said edges thereof are matable with said second grooves for trimming the corners of the electronic cabinet or an interconnecting strip whereby said edges define first edges for slidably engaging the inner second grooves of adjacent supporting members and second edges for slidably engaging the outer second grooves of said adjacent supporting members to interconnect said modular electronic cabinet with another modular electronic cabinet.

4,123,130

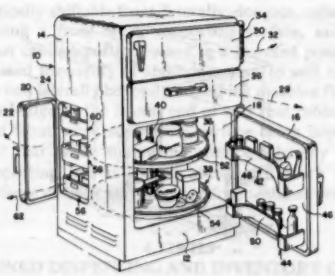
REFRIGERATOR APPARATUS

Lillian Locke, 20 Harmony Rd. South, Oshawa, Ontario, Canada (L1H 6T1)

Continuation of Ser. No. 706,170, Jul. 19, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,506

Int. Cl.[2] A47B *81/00*

U.S. Cl. 312—285 **7 Claims**



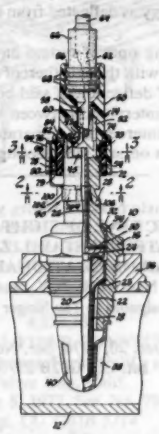
1. A refrigerator apparatus comprising a housing, said housing having a front panel, said housing having a pair of side panels in parallel spaced apart relationship adjacent said front panel, a first door hingably secured to said front panel, a second door hingably secured to one of said pair of side panels, a front access opening passing through said front panel, said front access opening disposed adjacent said first door when said first door is in a closed position, a side access opening passing through said one side panel, said side access opening disposed adjacent said second door when said second door is in a closed position, a compartment, said compartment disposed within said housing and accessible through said front access opening and said side access opening, a plurality of circular shelves disposed in overlying relationship to one another within said compartment, a shaft, said shaft rotatably supporting said plurality of circular shelves, a plurality of shelves fixedly secured to said first door, said plurality of shelves having circularly shaped wall portions affixed thereto, said circularly shaped wall portions residing adjacent portions of the marginal edges of said plurality of circular shelves when said first door is in said closed position, a plurality of pullout trays removably slidably secured within said compartment and totally removable from said compartment, said plurality of pullout trays being disposed passing through said side access opening when said second door is disposed in an open position relative to said side access opening, at least one of said plurality of pullout trays having curved wall portions affixed thereto, said curved wall portions residing adjacent portions of said marginal edges of at least one of said plurality of circular shelves.

4,123,131

VENTED ELECTRICAL CONNECTOR

Warren Pearce, Jr., Warren, and Andrew Russo, Jr., Fowler, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1977, Ser. No. 822,135
Int. Cl.[2] H01R 3/04
U.S. Cl. 339—117 R 4 Claims



1. An electrical connector for providing an environmentally protected, vented, temperature resistant electrical connection to an oxygen sensor or a like electrical device generating a low level electrical signal produced at least in part by means exposed to ambient air comprising:

a connector body of a relatively rigid, temperature resistant synthetic material, said connector body having a terminal receiving cavity extending therethrough from a plug-in opening to a lead receiving opening,

said connector body having an inner shroud at the plug-in opening of the terminal receiving cavity and an outer shroud radially spaced therefrom to form an annular chamber having an end wall,

said outer shroud projecting beyond the inner shroud,

a seal sleeve of temperature resistant elastomeric material disposed in said chamber in sealing engagement with an outer surface of the inner shroud,

said seal sleeve having a portion projecting beyond the inner shroud which portion has an inner surface adapted to receive and sealingly engage an insulator sleeve surrounding a hollow protruding center terminal of an oxygen sensor or like electrical device, and

vent means leading from an inlet at an exposed surface of the connector body to the terminal receiving cavity, said vent means including a radial passage through the inner shroud.

4,123,132

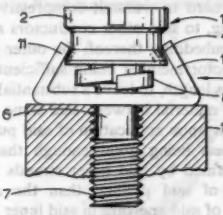
SCREW OR NUT AND A CAPTIVE WASHER

Paul R. Hardy, and Arthur T. Spencer, both of Biggleswade, England, assignors to PYE (Electronic Products Ltd.), Cambridge, England

Filed Sep. 12, 1977, Ser. No. 832,341
Claims priority, application United Kingdom, Oct. 12, 1976, 42331/76
Int. Cl.[2] H01R 9/10
U.S. Cl. 339—246 8 Claims

1. A combination of a threaded fastening member and a captive washer, the member having a circumferential shoulder generally perpendicular to an axis defined by the thread of the member, and the captive washer having an apertured portion and a further portion extending from said apertured portion, the combination being adapted for applying clamping pressure between the apertured portion of the captive washer and a clamping surface of a body upon tightening of the threaded member,

wherein said apertured portion has a non-planar shape arranged so as to be plastically deformed upon tightening of



the threaded fastening member to apply clamping pressure against the clamping surface, said further portion being arranged so as to be deflected toward the axis and engage over said shoulder in response to the plastic deformation,

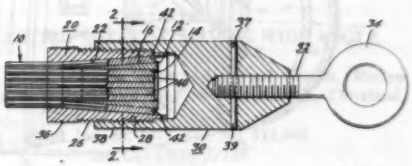
whereby said washer becomes coupled axially to the member upon the first tightening of the member.

4,123,133

METHOD AND APPARATUS FOR APPLYING A CONNECTOR TO ELECTRICAL CONDUCTOR STRANDS

Wiley J. Pickett, 620 N. Washington Ave., Moorestown, N.J. 08057, and Albert A. Boye, 608 College Blvd., Wenonah, N.J. 08090

Filed Jun. 6, 1977, Ser. No. 803,548
Int. Cl.[2] H01R 11/08
U.S. Cl. 339—273 R 23 Claims



1. In cable connector apparatus for enabling the grasping and longitudinal pulling of electrical conductor strands of copper or aluminum, comprising

an outer connector member having a longitudinal aperture extending therethrough providing a conical inner surface for at least a substantial portion of the length of said aperture;

a longitudinally apertured inner connector member positioned within said outer connector member and having a continuous and uninterrupted conical outer surface extending parallel to said conical inner surface of said outer connector member for receiving some of said electrical conductor strands within its longitudinal aperture, and for receiving others of of said electrical conductor strands between said conical outer surface thereof and said conical inner surface of said outer connector member, the outer diameters of said inner connector member being sufficient that when said outer connector member is urged longitudinally toward the larger end of said inner connector member said other strands are wedged and grasped between said outer conical surface of said inner connector member and said inner conical surface of said outer connector member;

the improvement wherein said inner connector member is of a material which is highly malleable compared with said inner surface of said outer connector member and at least

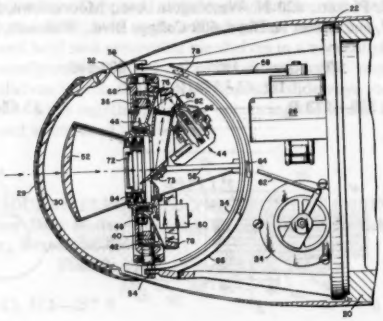
as malleable as the material of said cable, whereby said strands become embedded in both the inner and outer surfaces of said highly malleable material of said inner connector member when said wedging occurs, thereby to enhance the strength of said grasping of said strands without breaking them; said inner connector member being sufficiently hard to transmit compressive forces, due to said wedging, to said other conductors and thereby produce said embedding thereof; the outer diameter of said inner connector member being sufficient, over at least a portion of its length, to leave a substantial remanent thickness of said material between said some strands and said other strands upon application of said pulling; said remanent thickness being great enough that the maximum diameter formed by said other strands is greater, upon application of said pulling, than the diameter of the smaller end of said aperture in said inner connector member despite said embedding and espite compacting and extruding of said strands due to said compressive forces.

4,123,134

DUAL FIELD IMAGE SCANNER

Franklin J. Meyers, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 29, 1976, Ser. No. 727,310
Int. Cl.² G02B *27/17*
U.S. Cl. 350—6.7 **17 Claims**



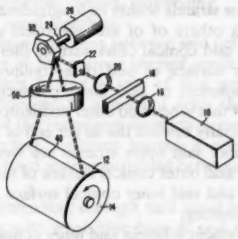
12. The invention as stated in claim 1, including a first set of lenses optically coupled to said reflective means.

4,123,135

OPTICAL SYSTEM FOR ROTATING MIRROR LINE SCANNING APPARATUS

Melbourne E. Rabedeau, Saratoga, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1977, Ser. No. 812,028
Int. Cl.² G02B *27/17*
U.S. Cl. 350—6.8 **12 Claims**



1. An optical system for line scanning apparatus comprising,

apparatus for generating a beam of rays of radiant energy,

apparatus for deflecting said beam of radiant energy,

an optical element interposed between said generating and said deflecting apparatus for focussing rays of said beam of radiant energy in the azimuth normal to the plane of deflection of said deflecting apparatus to a line substantially on said deflecting apparatus,

apparatus arranged for intercepting and imaging said beam of radiant energy as deflected from said deflecting apparatus, and

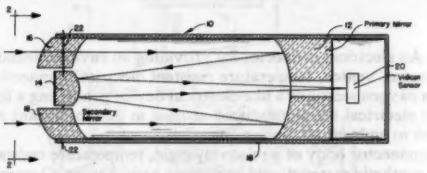
a nonrecollimating optical system having a negative cylindrical element with the axis thereof situated perpendicular to the plane of deflection of said beam by said deflection apparatus and interposed between said deflecting apparatus and said intercepting apparatus for focussing said deflected beam on said intercepting apparatus.

4,123,136

PIEZO-ELECTRIC LINE OF SIGHT CORRECTOR FOR INERTIAL PLATFORM STABILIZED SENSOR IN A STELLAR NAVIGATIONAL SYSTEM

Richard E. Dahab, New York, N.Y., and Howard M. Pollack, Fort Lee, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Dec. 20, 1976, Ser. No. 752,496
Int. Cl.² G02B *23/00*
U.S. Cl. 350—16 **7 Claims**



4. In a telescope including a sensor, and an optical system having a primary mirror and a secondary mirror in a folded-type optical system for focusing an image of a remote light source on the sensor, a line-of-sight corrector comprising piezo-electric actuator means mechanically coupled to one of said mirrors, and means deriving an error signal representing perturbances of the sensor and for introducing said error signal to said piezo-electric actuator means to compensate for such perturbances.

4,123,137

OPTICAL FIBER ARRANGEMENT FOR SPLICING FIBERS SECURED TO RIBBONLIKE TAPE

Enrique A. J. Marcatili, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 571,103, Apr. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 423,149, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,002, Jun. 12, 1972, Pat. No. 3,798,009. This application Oct. 26, 1976, Ser. No. 735,545
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96.21 **7 Claims**

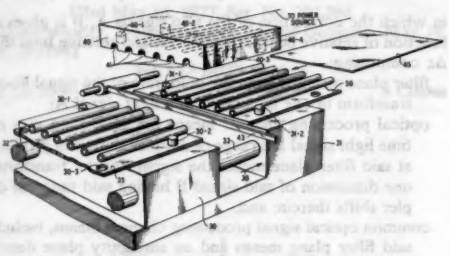
1. An optical fiber splice connection comprising:

a plate comprising a surface with a plurality of parallel fiber-receiving grooves, the interior surface of each said groove being formed to locate inserted fibers in planar, parallel relation;

a first group and a second group of optical fibers with respective mating end portions inserted from opposite directions into individual ones of said grooves with the ends of mating fibers abutted;

support means for said first and said second optical fiber groups, comprising for each group at least one ribbonlike tape continuously supporting the fibers along their full

length leading into said plate and attaching the fibers to said tape to maintain the fibers in a tranverse spacing that approximately corresponds to the transverse spacing of



said fiber-receiving grooves of said plate while permitting transverse displacement of each said fiber, allowing said approximate fiber-to-fiber spacing to transversely adjust to the specific spacing of said fiber-receiving grooves.

4,123,138

OPTICAL FIBER CONNECTOR

Robert J. Morrison, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed May 5, 1977, Ser. No. 794,289
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **6 Claims**

1. An optical fiber connector for joining fiber waveguide portions comprising:

(a) a sheet of elastically deformable material having opposed major plane surfaces;

(b) said material having at least one hole formed therein, said hole having the same shape and dimensions as the fiber portions to be aligned and joined by said connector;

(c) said hole extending through said sheet of material parallel to one of said major plane surfaces thereof and positioned to be nearer to said one surface than to the other surface thereof so that when said material is bent along the axial direction of said hole, the hole deforms to permit removal or insertion of said fiber portions.

4,123,139

OPTICAL FIBER CONNECTOR

Carl R. Sandahl, Morristown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1976, Ser. No. 754,601
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 **2 Claims**

1. An optical fiber connector comprising:

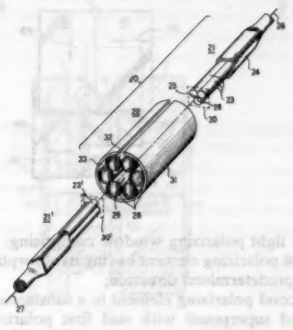
identical first and second male connectors each having;

at least three substantially identical parallel cylindrical inner rods held in tangential contact with each other so that they form an internal nest therebetween,

an optical fiber disposed within said nest, the end of said fiber and ends of said inner rods all terminating in a planar surface substantially perpendicular to the longitudinal axis of the fiber; and

a separate female connector sleeve having at least six substantially identical parallel cylindrical outer rods held in tangential contact with each other so that they form an internal nest to accommodate the inner rods of said first and second male connectors, the diameter of said outer rods being substantially greater than the diameter of said inner rods,

an outer spring means encompassing said outer rods and exerting radial pressure upon each of said outer rods to hold the same in fixed tangential contact with each other,



the optical fibers in each of said first and second male connectors being coupled end-to-end in axial alignment by slidingly engaging said first and second male connectors into axial abutment with each other within the internal nest formed by said outer rods.

4,123,140

REFLECTING SHEETING HAVING WIDE ANGLE RESPONSE

John R. Ryan, Jackson, Miss., and Paul Shalita, Roslyn Heights, N.Y., assignors to Ferro Corporation, Cleveland, Ohio

Filed Jun. 30, 1977, Ser. No. 811,945
Int. Cl.[2] G02B 5/128
U.S. Cl. 350—105 **9 Claims**

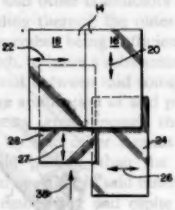
1. An encapsulated retroreflector having a wide angle response comprising sheeting having cavities of substantially uniform sizes and dimensions extending along one face thereof spaced apart by substantially flat ridges, said cavities having wall and bottom portions, light-reflecting beads partially embedded in said wall and bottom portions of the cavities of said sheeting, the embedded parts of said beads being coated with a reflective metal, adhesive means on said substantially flat ridges, a light-transmitting face film extending along said one face secured to said ridges by said adhesive means and serving to seal off said cavities, the perimeters of the openings of the cavities being adjacent to said face film, said beads extending substantially from points near said face film along and across said wall and bottom portions of the cavities and in cooperation with said uniform sizes and dimensions of the cavities serving to intercept and reflect incident light directed toward said sheeting through angles widely divergent from the normal thereto.

4,123,141

WINDOW SYSTEM COMPRISING LIGHT POLARIZERS

Norman W. Schuler, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1977, Ser. No. 830,207
Int. Cl.[2] G05D *25/00*; G02B *27/28*
U.S. Cl. 350—159 **5 Claims**



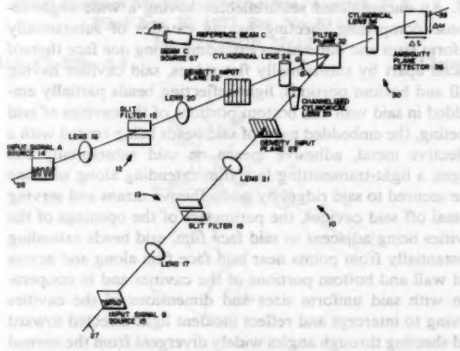
1. A light polarizing window comprising:
a first polarizing element having its absorption axis aligned in a predetermined direction;
a second polarizing element in a substantially parallel plane and superposed with said first polarizing element and having its absorption axis normal to the absorption axis of the said first polarizing element;
a third polarizing element adjacent to said second polarizing element and coincident with the plane of said second element, said third element having its absorption axis normal to the absorption of said second polarizing element; and
a movable polarizing element slideably mounted between a first position where it is superposed with said third polarizing element and a second position where it is interposed between said first and second polarizing elements, said moveable polarizing element including a polarizer having its absorption axis normal to that of the third polarizing element and a wave retarder on its surface closest to a source of light incident on said moveable element, said retarder being on the order of ½, 3/2, 5/2 or greater waves of retardation with respect to a reference wave length of the visible spectrum.

4,123,142

AMBIGUITY PLANE OPTICAL PROCESSOR INCORPORATING MAGNETO-OPTIC, BUBBLE DOMAIN HISTOGRAPH

David L. Fleming, Edina; Thomas R. Johansen, Minneapolis, and Ernest J. Torok, St. Paul, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 28, 1977, Ser. No. 772,880
Int. Cl.[2] G06G *9/00*; G03H *1/16*
U.S. Cl. 350—162 SF **5 Claims**



1. An ambiguity plane optical processor that calculates the ambiguity function, $\Psi(\Delta w, \Delta t)$, of two signals A, B given by the equation

$$\Psi(\Delta w, \Delta t) = \int A(t)B(t+\Delta t)e^{-j\Delta wt}dt$$

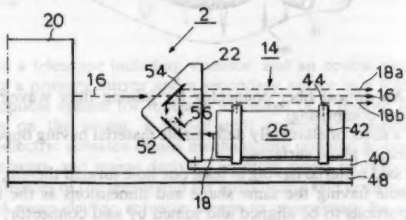
in which the correlation of the two signals A, B is given as a function of relative doppler shifts, Δw, and relative time shifts, Δt, comprising:
filter plane means storing the hologram of the signal Fourier transform in one dimension of a light signal A;
optical processing channel means for generating in a real-time light signal B a range of doppler shifts and producing at said filter plane means the signal Fourier transform in one dimension of said signal B having said range of doppler shifts therein; and,
common optical signal processing channel means, including said filter plane means and an ambiguity plane detector means, for generating the product of said stored hologram of the signal Fourier transform in one dimension of said signal A and of said signal Fourier transform in one dimension of said signal B, said ambiguity plane detector means displaying said product as the correlation of said signals A and B with the relative time shifts displayed along the X axis and the relative doppler shifts displayed along the Y axis.

4,123,143

LASER BEAM ALIGNING APPARATUS

Ami Yachin, Herzlia, and Baruch Gozhansky, Raanana, both of Israel assignors to Laser Industries Ltd., Tel Aviv, Israel

Filed Nov. 23, 1976, Ser. No. 744,422
Claims priority, application Israel, Nov. 27, 1975, 48554
Int. Cl.[2] A61B *17/36*
U.S. Cl. 350—171 **5 Claims**

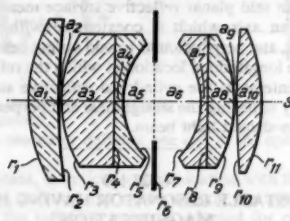


1. Laser apparatus particularly useful for freehand aligning of a working laser beam with respect to a working area, comprising: a first laser generating a high-energy working laser beam; a second laser generating a low-energy visible laser beam having a divergence angle not substantially greater than that of the working laser beam; a manipulatable guide device including a hand manipulator and focussing means for manipulating the working laser beam and for focussing same on the working area; and a beam splitting device oriented to receive said visible laser beam and to split same into sections disposed on opposite sides of the working laser beam as both beams enter the manipulatable guide device; said beam splitting device comprising a first mirror, a second mirror, and a beam-splitter; the first mirror being oriented to direct the visible laser beam to impinge the beam splitter; the beam-splitter being oriented to transmit a portion of the impinged visible beam to said second mirror, and to reflect another portion thereof back to said first mirror, the latter portion of the visible beam being reflected by the first mirror to the second mirror along a path which is spaced from and substantially parallel to that of the first portion of the beam transmitted by the beam splitter to the second mirror; the second mirror transmitting the working laser beam therethrough and being oriented to reflect the two visible beam portions to paths equally spaced on opposite sides of the working laser beam.

4,123,144
FOUR-MEMBER GAUSS OBJECTIVE

Walter Mandler; Garry Edwards, and Erich Wagner, all of Midland, Canada, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,386
Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2621981
Int. Cl.[2] G02B 9/36
U.S. Cl. 350—222 9 Claims



1. A four component six lens element Gauss type objective having an aperture ratio of at least 1:2.4 and a field angle of greater than 40°, comprising:

a pair of inner, cemented doublet meniscus components concave toward and defining a central diaphragm space, each of said doublet components having planer bond surfaces and said doublet components having at least one spherical surface each, which are of the same radius of curvature and which are arranged symmetrically with respect to the location of the diaphragm; and

a pair of outer components of positive power of refraction including a first single component positive meniscus concave toward the diaphragm space and being positioned ahead of said doublet components in the direction of light travel, said outer components having one spherical surface each, which are of the same radius of curvature and which are arranged symmetrically with respect to the location of the diaphragm; and

wherein said lens consists essentially of the following design parameters:

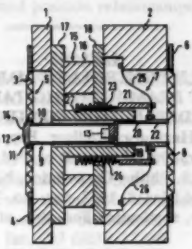
Focal length: $f = 100$
Aperture ratio: 1:2
Back focal length: $s' = 59.21$
Field angle: $\pm 22.5°$

Surface No. (i)	Radius (r_i)	Distance to next surface (a_i)	Lens No.	Refractive Index ($n_{e,i}$)	Abbe-Number ($v_{e,i}$)
1	48.88	8.89	1	1.62286	60.08
2	182.96	0.38		1.0	—
3	36.92	15.11	2	1.58565	46.17
4	∞	2.31	3	1.67764	31.97
5	23.06	9.14		1.0	—
6	(diaphragm)	13.36		1.0	—
7	−23.91	1.92	4	1.57046	42.56
8	∞	7.77	5	1.64128	55.15
9	−36.92	0.38		1.0	—
10	1063.24	6.73	6	1.62286	60.08
11	−48.88	—		1.0	—

4,123,145
OPTICAL PATH LENGTH MODULATOR

Stephen C. L. Botcherby, Dorking, and Christopher P. Starbuck, London, both of England, assignors to Decca Limited, London, England

Filed Aug. 26, 1975, Ser. No. 608,198
Claims priority, application United Kingdom, Sep. 3, 1974, 38502/74
Int. Cl.[2] G05D 25/00
U.S. Cl. 350—269 9 Claims



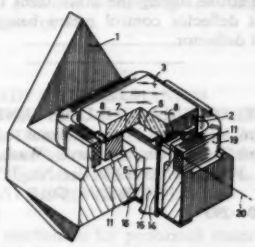
1. An optical path length modulator comprising; two spaced apart substantially parallel flexible supporting members;

a support which is mounted on and between said flexible supporting members for movement to and fro along an axis, a converging lens and a concave mirror, the lens and the mirror being carried by the support, the lens having a focal length equal to the distance between the lens and the surface of the mirror and the mirror having a radius of curvature equal to the focal length of the lens; and means for vibrating the support to and fro along said axis.

4,123,146
ELECTRICALLY CONTROLLABLE PIVOTING MIRROR ARRANGEMENT

Jan C. W. Dragt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,079
Claims priority, application Netherlands, Jan. 24, 1977, 7700674
Int. Cl.[2] G02B 27/17
U.S. Cl. 350—285 3 Claims



1. An electrically controllable pivoting mirror arrangement suitable for use in an apparatus for optically reading information tracks of an information carrier with the aid of a beam of radiation, or for writing information tracks on an information carrier comprising:

a frame;

a pivoting mirror having a reflective front and a back;

a mounting plate connected on one side to the back of the mirror;

mirror positioning means on the side of said mounting plate

connected to the mirror for preventing relative motion between the mirror and the mounting plate;

a permanent magnet connected to a side of the mounting plate opposite the side that is connected to the mirror;

magnet positioning means on the side of the mounting plate connected to the magnet for preventing relative motion between the magnet and the mounting plate; and

a mirror support means for pivotally supporting the pivoting mirror and comprising a bearing support connected to the frame, and a mirror bearing extending through the mounting plate between the bearing support and the back of the mirror.

4,123,147

ELECTRICALLY CONTROLLED ADJUSTING DEVICE FOR A LIGHT BEAM WITH DIGITAL AND ANALOG DEFLECTION CONTROL

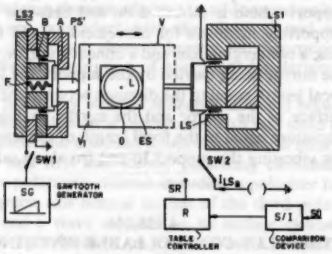
Bernhard Hill, Hamburg; Rudiger Pepperl, Pinneberg, and Johann Kruger, Quickborn, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1977, Ser. No. 775,454

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1976, 2611617

Int. Cl.[2] G11B *21/02*

U.S. Cl. 350—285 **8 Claims**



1. A controlled device for positioning a light beam with digital and analog deflection control to track data spiral segments and intervening guide segments on a rotating disk, comprising a light deflector, a slow analog light deflector control means for actuating said light deflector with a small stroke during the first turn of the data spiral, a digital light deflector control means for actuating said light deflector with a relatively large stroke during the other turns of the spiral, said digital light deflector control means being coupled to the analog light deflector.

4,123,148

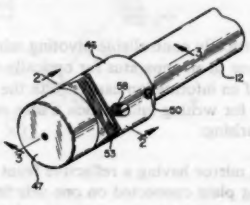
REFLECTIVE LASER LINE GENERATOR

Dale E. Laird, Vancouver, Wash., assignor to Industrial Electrical Control Corporation, Vancouver, Wash.

Filed Apr. 13, 1977, Ser. No. 787,148

Int. Cl.[2] G02B *5/10*; G01B *11/00*

U.S. Cl. 350—293 **5 Claims**



1. Apparatus for generating a straight line light beam comprising:

a. A laser emitting a collimated output beam along a predetermined light path;

b. a frame having means for mounting said laser and having an opening defined therein in a maner for passing said output beam;

c. a planar reflective surface mounted in said frame, intersecting said light beam in a manner to reflect said output beam into a reflected beam which is oriented approximately 90° with respect to said output beam;

d. a cylindrical reflective surface means, having a longitudinal axis which generally is perpendicular to said reflected beam and offset laterally therefrom, located so that said reflected beam strikes said cylindrical reflective surface means transversely off center and substantially normal to its longitudinal axis, for further reflecting said reflective beam into a thin, fan-shaped light beam;

e. wherein said planar reflective surface means is rotatable about an axis which is coextensive with its reflective surface, and perpendicular to said output beam, for adjusting the longitudinal location at which the reflected output beam intersects the cylindrical reflective surface means, thereby adjusting the straightness and perpendicularity of said fan-shaped light beam.

4,123,149

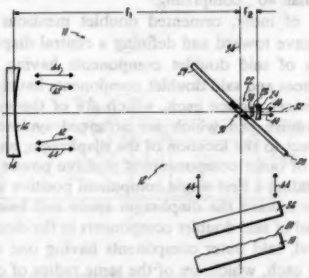
UNSTABLE RESONATOR HAVING HIGH MAGNIFICATION

Peter P. Chenausky, Avon, and William H. Glenn, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 8, 1977, Ser. No. 814,052

Int. Cl.[2] H01S *3/082*

U.S. Cl. 350—294 **16 Claims**



1. An unstable resonator having a centerline axis comprising:

a first optical cavity of providing high resolution to the bandwidth of a beam of electromagnetic radiation, including,

a first mirror, located on and symmetrically about the centerline axis, defining one end of the first optical cavity and having a reflective surface with a first focal length,

a diffraction grating, located off the centerline axis, defining the other end of the first cavity, and

a reflector mirror, located on and symmetrically about the centerline axis, having a flat reflective surface in a plane which intersects the centerline axis at an angle and forms a folded optical path between the reflective surface of the first mirror and the diffraction grating to provide line of sight communication therebetween; and

a second optical cavity, located on and symmetrically about the centerline axis, with the reflector mirror disposed therein, defined at one end by the first mirror whereby the first and second cavities are partially superimposed and at the other end by a second mirror with a reflective surface having a second focal length less than the first focal length of the first mirror, wherein the reflective surface of the second mirror is in line of sight communication with the

reflective surface of the first mirror through an aperture in the reflector mirror.

4,123,150

STABLE RESONATORS FOR RADIAL FLOW LASERS

Edward A. Sziklas, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 21, 1977, Ser. No. 789,751

Int. Cl.[2] H01S *3/081*

U.S. Cl. 350—294 **12 Claims**

1. A stable resonator comprising:

an optical cavity,

an unstable resonator defining one end of the optical cavity, and

reflector means, in optical communication with the unstable resonator, defining the other end of the optical cavity wherein the reflector means is adapted for cooperating with the unstable resonator to form a stable resonator whereby radiation passing from the unstable resonator is reflected back into the unstable resonator.

4,123,151

PERISCOPIC MIRROR SYSTEM WITH SELECTABLY CHANGEABLE DIRECTION OF VIEWING

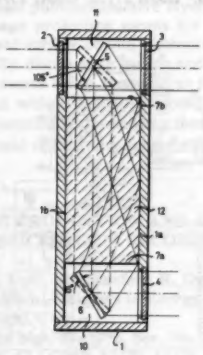
Friedrich Aurin, Heidenheim, Germany, assignor to Carl Zeiss, Oberkochen, Germany

Filed May 2, 1977, Ser. No. 792,680

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623955

Int. Cl.[2] G02B *5/08, 7/24*

U.S. Cl. 350—301 **10 Claims**



1. Periscope structure having the capability of providing a selected one of two 180° opposed generally horizontal viewing axes, said structure comprising an entrance mirror and an exit mirror, a hollow shaft supporting both said mirrors in spaced relation and for rotation about parallel pivot axes, said mirrors being positionable in a first position relationship to reflect light at substantially right angles in the manner of a periscope wherein said entrance mirror reflects entering light directly to said exit mirror along a vertical axis defined by and between said mirrors, said light entering on a first of said viewing axes from one side of said shaft, and wherein said exit mirror reflects such entrance-mirror reflected light on an exit axis extending from the other side of said shaft, an intermediate mirror within said shaft between said entrance and exit mirrors and facing but offset in substantial parallelism to said vertical axis, said offset being in the direction of said other side of said shaft, said entrance and exit mirrors being also positionable in a second position relationship wherein said entrance mirror reflects to said exit mirror via said intermediate mirror light entering on the second of said viewing axes and from said other side of said shaft and wherein said exit mirror reflects such intermediate-mirror reflected light on said exit axis, and means for moving said entrance and exit mirrors from one to the other of said first and second position relationships.

4,123,152

CIRCUMFERENTIAL STEREO SPECTACULAR WITH A MOSAIC IN A SCENE

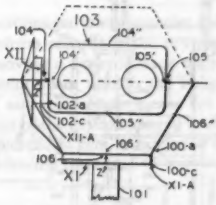
Henry M. Farnum, Executive House, 225 E. 46th St., New York, N.Y. 10017

Continuation-in-part of Ser. No. 302,901, Nov. 1, 1972, Pat. No. 3,989,362. This application Aug. 5, 1976, Ser. No. 711,976

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.[2] G03B *37/00*

U.S. Cl. 352—69 **1 Claim**



1. In a stage with a cyclorama, an improved apparatus to record and display a scene, comprising:

a stage comprising a mosaic of locations in predetermined relationship to a cyclorama comprising a generally symmetrical geometric figure;

said cyclorama around at least a portion of said stage and generally spherical, with its center at a selected location in said mosaic; and

a reflecting means universally pivoted at a selected location in said mosaic and drive means for rotating said reflecting means at a uniform speed in a panning motion to reflect said scene to a camera comprising recording means to record said scene on film.

4,123,153

ADVANCE MECHANISM

John N. Brucat, Floral Park, N.Y., assignor to Instructional/-Communications Technology, Inc., Huntington Station, N.Y.

Continuation-in-part of Ser. No. 664,145, Mar. 5, 1976, Pat. No. 4,053,214. This application Feb. 8, 1977, Ser. No. 766,712

Int. Cl.[2] G03B *1/22*

U.S. Cl. 352—191 **8 Claims**

1. An advance mechanism for perforated materials for advancing the material through a path of light comprising:

A support structure adapted to be in line with a source of light so that light passes through an aperture in the support;

material support and advance means for directing the perforated material along the pathway into and out of alignment with the aperture;

a pawl mechanism including spring means on the support adjacent to the aperture and normally positioned in a normally retracted position in alignment with a slot adjacent to the aperture in the support;

drive means for cooperating with the material advance means and for biasing the spring and directing the pawl

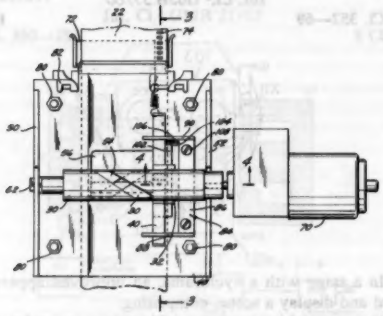
mechanism through the slot into engagement with a perforation in the material and then along the slot a predetermined distance to advance the material and then releasing the pawl mechanism permitting the spring to return the pawl to the retracted position out of the slot;

return means responsive to release of the pawl mechanism and retraction of the pawl through the slot to return the pawl to a normally retracted position;

limit means positioned on the support and on the pawl mechanism to restrict the distance of movement of the pawl mechanism along the length of the slot;

the drive means including a rotatable drive cylinder on the support and an integrally formed coupling extending therefrom, the coupling adapted to be coupled directly to the drive shaft of a motor and to prevent relative rotation of the cylinder with respect to the shaft of the motor and thereby prevent slippage between the cylinder and the drive shaft of the motor;

the pawl mechanism including an elongated leaf spring mounted on the support and having a downwardly extending pawl in alignment with and in position for extension through the slot in the support, a drive projection



extending from the leaf spring and in position for engagement by a portion of the drive means, the elongated leaf spring being movably positioned on the support so that engagement of the drive means with the drive projection and application of a force thereto will bias the leaf spring until the pawl extends through the slot into engagement with a perforation in the perforated material and then the leaf spring will be moved by the drive means and the perforated material accordingly advanced, and when the drive means is disengaged from the leaf spring, the leaf spring will return to its initial configuration with the pawl disengaged from the perforated material and withdrawn through the slot in the support whereupon the return means can return the leaf spring to the normal retracted position;

the drive projection on the elongated member being an upwardly extending prong which extends in the direction of movement of the elongated member when subjected to a force from the drive means; and

the drive cylinder including at least one helical aperture therethrough in alignment with the aperture in the support.

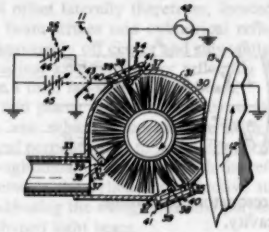
4,123,154

COMBINED CORONA GENERATOR AND IMAGING SURFACE CLEANER

Donald J. Fisher, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1977, Ser. No. 773,999
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 **5 Claims**

1. In an electrostatographic reproducing machine including an imaging surface and cleaning means for removing residual material from said imaging surface, said cleaning means including at least one cleaning element which is arranged for moving engagement with said imaging surface, and further including corona generating means for applying a charging or a neutralizing corona emission to said cleaning element, said corona generating means including at least one corona discharge electrode, the improvement wherein said cleaning element is arranged for movement to frictionally engage said imaging surface and said corona discharge electrode whereby said clean-



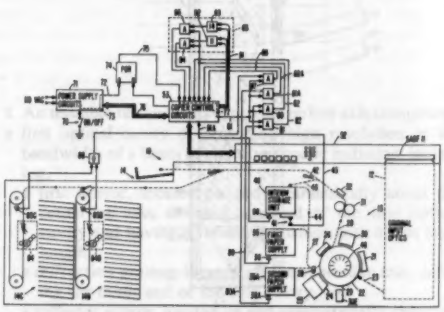
ing element is adapted to clean both said imaging surface and said corona discharge electrode, wherein said cleaning means includes a first of said corona generating means for selectively applying a neutralizing corona to said cleaning element and a second of said corona generating means for applying a charging corona to said cleaning element to bias said cleaning element, and wherein each of said corona generating means include at least one corona discharge electrode and wherein said cleaning element is arranged to engage each of said corona discharge electrodes.

4,123,155

COPY PRODUCTION MACHINE HAVING A DUPLEX COPY MODE

Wallace L. Hubert, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,453
Int. Cl.[2] G03B *27/32*; G03G *15/00*
U.S. Cl. 355—26 **12 Claims**



1. A copy production machine having a duplex copy production mode, copy production means having copy path means for transferring images to copy paper being transported therethrough, duplex copy interim storage means, duplex control means to direct single image duplex copies from said copy production means to said interim storage means and completed duplex copies to an output portion of said machine, first means indicating copies in said interim storage means,

the improvement including in combination:

power on means indicating a power on sequence; and

control means jointly responsive to said first indicating means and to said power on means to actuate said duplex

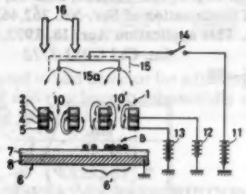
control means to said machine to select copy production in said duplex mode.

4,123,156

METHOD AND APPARATUS FOR FORMING AN ELECTROSTATIC LATENT IMAGE USING AN IRON CONTROL GRID WITH DUAL ELECTRICAL FIELDS

Shigeru Inowa; Issei Nakamura, and Tutomu Furuya, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Hachioji, Japan

Filed Apr. 19, 1977, Ser. No. 788,831
Claims priority, application Japan, Apr. 26, 1976, 51-47410
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 SC **12 Claims**



1. Apparatus for forming an electrostatic image on a recording medium, in which a control grid controls ion current, comprising:

a control grid having a plurality of apertures and positioned adjacent to said recording medium for controlling ion current, said control grid having a photoconductive layer, a conductive layer and an insulating layer, which are superposed in this order;

means for forming a first electric field between said control grid and said recording medium to direct ions toward said recording medium, said means being connected to said conductive layer;

means for forming a second electric field in the apertures of said control grid to prevent ions from passing through said apertures;

an electrically discharging means for projecting ions on the surface of said photoconductive layer;

an optical image projection means for forming an optical image on said surface of said photoconductive layer; and

said electrically discharging means and said optical image projection means being arranged so that the area of said control grid which is being exposed to the ion current from said electrically discharging means is exposed to the light from said optical image projection means.

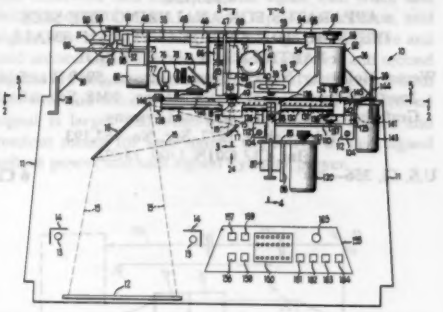
4,123,157

DRY PROCESS PRODUCTION AND ANNOTATION OF ARCHIVAL MICROFORM RECORDS FROM HARD COPY

Peter H. Klose, Troy, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 17, 1976, Ser. No. 742,645
Int. Cl.[2] G03B *27/70, 13/26, 27/32*
U.S. Cl. 355—43 **38 Claims**

1. In a dry-process apparatus for producing archival microform records from light reflecting hard copy wherein a light image reflected from the hard copy is reduced to microimage size and applied at an imaging station to a dry-process mask film strip which is photosensitive to and imaged by the light reflecting hard copy and which is developed by heat to provide microimaged transparencies therein, and wherein the microimaged transparencies in the mask film strip are transferred by radiant energy above a certain critical value passing therethrough to a dry-process microform film which has archival properties and which is sensitive to an imaged and developed by the radiant energy above the critical value applied thereto through the dry-process mask film strip to provide imaged microform records therein which conform to the transparent microimages in the dry-process mask film strip and which have archival properties, the improvement comprising an imaging station including a platform for receiving the hard copy and a projection means for reducing the light image reflected from the hard copy on the platform to microimage size and applying the same to the dry-process mask film strip



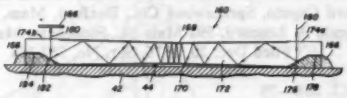
for producing microimaged transparencies therein for providing imaged microform records in the dry-process microform film, means for moving a desired image microform record in the dry-process microform film to the imaging station, and means including said projection means for expanding and projecting an image of the desired imaged microform record in the dry-process microform film in expanded normal size onto the platform for viewing the same.

4,123,158

PHOTOELASTIC STRAIN GAUGE

Zinovy V. Reytblatt, 3550 N. Lake Shore Dr., Chicago, Ill. 60657

Filed May 9, 1975, Ser. No. 576,197
Int. Cl.[2] G01B *11/18*
U.S. Cl. 356—32 **26 Claims**



1. A photoelastic strain gauge adapted to be bonded to a surface of a workpiece for displaying visual patterns representative of the strain in such workpiece, said strain gauge having a mounting plane adapted to be parallel to the workpiece surface, said strain gauge comprising two substantially parallel outer sheets of reflective material, a slab of photoelastic material between said outer sheets, an inner sheet of reflective material in said slab and being parallel to said outer sheets, said slab having an entry aperture for light to enter said slab and an exit aperture arranged to receive light which has passed through said slab to produce the visual patterns, first reflective means adjacent to one end of said slab for receiving light which has passed through said entry aperture and for directing such light at a predetermined angle so as to be reverberated within said slab between one of said outer sheets and said inner sheet, a further sheet of reflective material adjacent to the other end of said slab and being disposed substantially perpendicular to said inner and outer sheets and arranged to receive light which has been reverberated between said one outer sheet and said inner sheet and to reflect such light toward said second outer sheet for further reverberation between said second outer sheet and said inner sheets, and second reflective

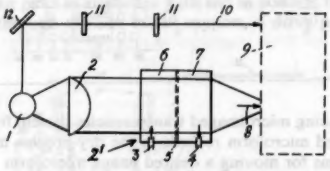
means adjacent to said one end of said slab for receiving light which has been reverberated by said sheets of reflective material and for directing such light to said exit aperture, thereby to increase the length of path of light through said slab so as to cause the visual patterns to be amplified, and to decrease the effects of bending and shear stresses in the workpiece.

4,123,159

APPARATUS FOR ANALYZING THE SIZE DISTRIBUTION AND QUANTITY OF SMALL PARTICLES IN AN AEROSOL

Werner Holländer, No. 15, Astenbergstrasse, 5949 Westfeld, and Josef Schörmann, No. 4, Im Kampe, 5948 Schmallenberg, Grafschaft, both of Fed. Rep. of Germany

Filed Feb. 9, 1977, Ser. No. 767,193
Int. Cl.² G01N *1/00, 15/02*
U.S. Cl. 356—38 **6 Claims**



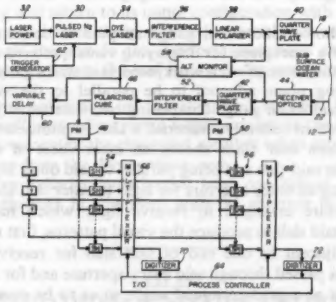
1. An apparatus for analyzing the size distribution and quantity of small particles in an aerosol, which comprises at least one filter containing linear pores extending substantially normal to the filter surface, said filter being substantially opaque outside the pores, means for directing light onto said filter surface on one side thereof, and means for measuring the change in transmission of said light through said pores due to the retention of particles in and around the pores.

4,123,160

METHOD AND APPARATUS FOR REMOTELY MEASURING SUB-SURFACE WATER TEMPERATURES

Bernard Caputo, Sprucewood Cir., Boxford, Mass. 01921, and Donald A. Leonard, 594 Main St., Stoneham, Mass. 02180

Filed Dec. 20, 1976, Ser. No. 752,161
Int. Cl.² G01J *5/44, 5/60*
U.S. Cl. 356—75 **9 Claims**



1. Apparatus for remotely monitoring the subsurface property of a body of water comprising

(a) first means for generating and directing a beam of laser light circularly polarized in one direction and of a frequency adapted to penetrate deeply into said water,

(b) second means for detecting the Raman backscatter produced by said beam, said backscatter including components polarized in said one direction and in the opposite direction, and,

(c) third means for analyzing the dual polarization backscatter on a wavelength segment by wavelength segment basis, and,

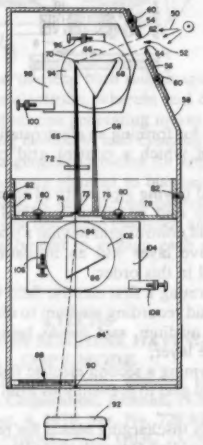
(d) fourth means for obtaining separate ratios of the intensity of one polarization component to the other polarization component for each wavelength segment, said ratios being a function of the property of the water.

4,123,161

APPARATUS FOR AND METHOD OF EXAMINING LIGHT

George J. Pappas, 866 Croton Rd., Wayne, Pa. 19087

Continuation of Ser. No. 480,565, Jun. 18, 1974, abandoned, which is a continuation of Ser. No. 262,463, Jun. 14, 1972, abandoned. This application Apr. 18, 1977, Ser. No. 788,578
Int. Cl.² G01J *3/12*
U.S. Cl. 356—99 **7 Claims**



1. A system for examining light of different wavelengths comprising:

a source of light;

means including a wide slit illuminated by said source and a dispersion means for separating said light into a first pair of divergent beams and a second pair of divergent beams separated by an intermediate beam converging to a point, light of longer wavelengths emanating as rays in said first pair of divergent beams, light of shorter wavelengths emanating as rays in said second pair of divergent beams;

a narrow slit situated between said dispersion means and the point at which said intermediate beam converges; and

means for measuring the dispersion of said beams with respect to a reference point.

4,123,162

MULTIOSCILLATOR RING LASER GYRO OUTPUT INFORMATION PROCESSING SYSTEM

Virgil E. Sanders, Newbury Park, Calif., assignor to Litton Systems, Inc., Woodland Hills, Calif.

Filed Feb. 9, 1977, Ser. No. 766,986
Int. Cl.² G01B *9/02*; G01P *9/00*
U.S. Cl. 356—106 LR **10 Claims**

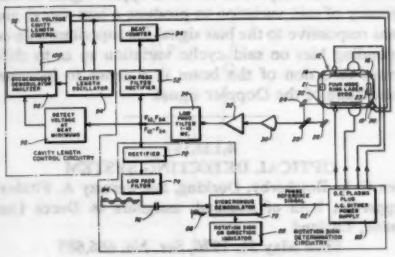
1. A ring laser gyro comprising:

a multi-oscillator ring laser including means for generating four modes of laser oscillation at four respectively different frequencies, and with two of the modes propagating in each direction;

an optical detector for receiving all of said four modes;

means coupled to said detector for determining the rate of rotation of said ring laser;

means coupled to said detector for determining the direction of rotation of said ring laser; and



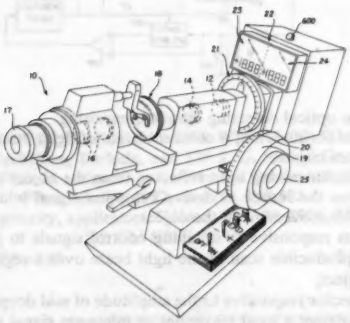
servo means coupled to said detector for adjusting the length of the cavity of said ring laser to substantially equalize the intensity of said four modes.

4,123,163

LENS POWER DISPLAY IN PRESCRIPTION FORM

Howard E. Chace, Southbridge, and Anthony F. Szwarc, Sturbridge, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Nov. 12, 1976, Ser. No. 741,257
Int. Cl.[2] G01B 9/00
U.S. Cl. 356—124 **7 Claims**



1. The combination comprising a lens measuring instrument for determining the optical powers of a test lens in each of two respectively orthogonal principal meridians, each said optical power being expressed as the net refractive power of said lens in the respective said meridians;

means for providing first and second signed electrical signals whose signed magnitudes are respectively representative of said optical power of said test lens as expressed in terms of said net refractive power in the respective meridian;

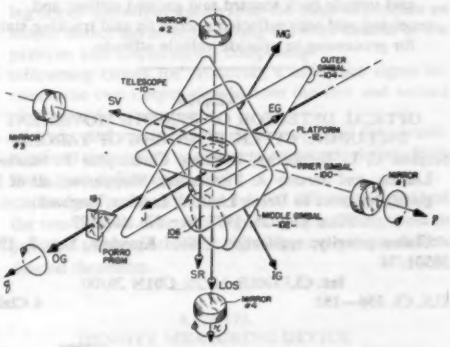
and electronic means at least semiautomatically responsive to said first and second signals representative of said refractive powers in the respective said meridians for providing signals representative of said optical powers expressed in prescription form having a signed net refractive power characterized as sphere power and a signed component of cylinder power and further including means for selectively, alternatively establishing a positive or a negative notation control signal; means responsive to said first and said second signed signals for providing a difference signal representative of the arithmetic difference therebetween, said difference signal assuming the sign established by said notation control signal for readout as said cylinder component of said prescription-form expression; means responsive to said notation control signal, the sign status of said first and second signals and the relative magnitudes between said first and second signals for selecting for readout as said sphere power, when said notation control means indicates a negative notation, said signed first signal if either said first signal is positive and said second signal is negative or both said first and second signals are negative and said second signal is larger or both said first and second signals are positive and said first signal is larger and otherwise said signed second signal and, when said notation control means indicates a positive notation, said signed first signal if either said first signal is negative and said second signal is positive or both said first and second signals are negative and said first signal is larger or both said first and second signals are positive and said second signal is larger and otherwise said second signal; and readout means for said signals indicative of said signed sphere power and said signed cylinder power.

4,123,164

AUTOCOLLIMATING ASSEMBLY FOR THE SELF-CALIBRATION OF A STELLAR NAVIGATIONAL SYSTEM

Ronald Tambor, Maplewood, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jan. 3, 1977, Ser. No. 756,517
Int. Cl.[2] G01B 11/26; G01C 1/10
U.S. Cl. 356—152 **7 Claims**



1. In a stellar navigation system having an inertial platform bearing a tracking or position-sensing sub-system including a sensor and a telescope with a lens system for focusing collimated light from a selected star into the plane of the sensor, the improvement comprising an assembly for accurately indexing the tracking or position-sensing sub-system which includes:

a light source;

means for directing light from said source through the lens system of the telescope to be collimated thereby;

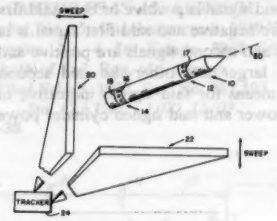
a position-indexing mirror placed outside the inertial platform so that when the telescope is in alignment with the mirror, the mirror will reflect the collimated light back through the lens system into the plane of the sensor, thereby causing the sensor to generate electrical signals representing the angular displacement of the reflected light from a nominal position on the sensor; and

means for moving the telescope from a normal viewing position into alignment with the position-indexing mirror.

4,123,165
ATTITUDE DETERMINATION USING TWO COLOR, DUAL-SWEEPING LASER SYSTEM

David B. Brown, Huntsville; Jerry W. Vickers, Toney, both of Ala., and Kynric M. Pell, Laramie, Wyo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1977, Ser. No. 801,885
Int. Cl.[2] G01B 11/26
U.S. Cl. 356—152 6 Claims



4. In a tracking system having a transmitter-receiver adapted for tracking a moving vehicle wherein retroreflector arrays are disposed on the surface of said vehicle, a method of detecting the attitude of said vehicle comprising the steps of:

launching a vehicle into a general flight trajectory;

sweeping first and second beams of optical energy from a single ground station across said vehicle;

filtering said optical energy impinging on said retroreflector arrays from said tracking station for retroreflecting separate and distinct frequencies from respective arrays;

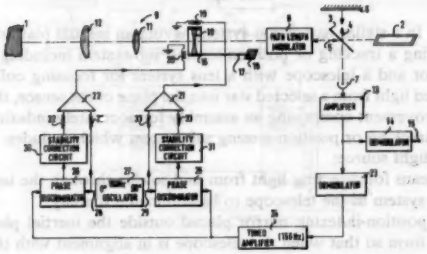
retroreflecting impinging energy of said optical energy from said first and second retroreflector arrays on the surface of said vehicle back toward said ground station; and

receiving said retroreflected energy by said tracking station for processing to provide vehicle attitude.

4,123,166
OPTICAL DETECTOR OF REMOTE MOVEMENT INCLUDING CYCLIC SCANNING OF TARGET

Stephen C. L. Botcherby, Dorking; Christopher P. Starbuck, London, and Jeremy A. Fitzherbert, Shepparton, all of England, assignors to Decca Limited, London, England

Filed Aug. 26, 1975, Ser. No. 608,197
Claims priority, application United Kingdom, Sep. 3, 1974, 38501/74
Int. Cl.[2] G01B 11/26; G01N 29/00
U.S. Cl. 356—152 6 Claims



1. A detector of remote movement, comprising:

means for projecting a beam of coherent light at a target;

means for mixing light reflected from the target with reference light to obtain a Doppler signal representing movement of the target;

means for providing cyclic variation in the direction of the projected light beam to move the point of impingement thereof over the surface of the target;

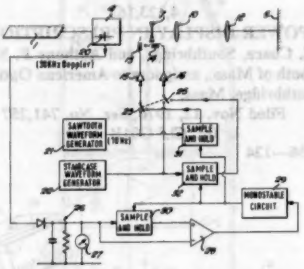
means responsive to a phase relationship between the variation in the direction of the projected light beam and modulation of the amplitude of the Doppler signal at the frequency of said variation to produce a bias signal; and

means responsive to the bias signal for superimposing corresponding bias on said cyclic variation so as to shift the mean direction of the beam in a sense to increase the amplitude of the Doppler signal.

4,123,167
OPTICAL DETECTING SYSTEM

Stephen C. L. Botcherby, Dorking, and Jeremy A. Fitzherbert, Shepperton, both of England, assignors to Decca Limited, London, England

Filed May 21, 1976, Ser. No. 686,687
Claims priority, application United Kingdom, May 30, 1975, 23640/75
Int. Cl.[2] G01B 11/26; G01N 29/00
U.S. Cl. 356—152 7 Claims



1. An optical detecting system comprising:

means for directing a coherent beam of light from a source at an object;

means for mixing light reflected from the object with light from the source to derive a doppler signal which represents movement of the object;

means responsive to scanning control signals to provide a reproducible scan of the light beam over a region of the object;

a detector responsive to the amplitude of said doppler signal to detect a local maximum or minimum signal amplitude thereof;

means operable in response to the detector to determine the values of the said control signals associated with the local maximum or minimum signal amplitude; means operable to store representations of the control signals when the detector detects said local turning point, and

means for reading out the said stored representations to substitute them in place of the control signals so as to redirect the said beam at a region, of the said object, that provides the detected local maximum or minimum signal amplitude of the doppler signal.

4,123,168
LASER OPTICAL LEVER ADJUNCT

Thomas H. Howell, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 818,187
Int. Cl.[2] G01B 11/26; G01C 1/00
U.S. Cl. 356—152 3 Claims

1. An apparatus for measuring rocket attitude during the launch phase comprising: a laser source for providing a laser beam, said source being pointed towards said rocket along an off-line axis with respect to the longitudinal rocket axis; a

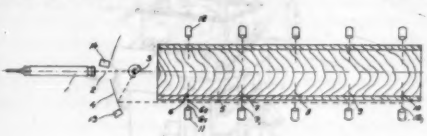
mirror positioned on said rocket normally aligned to the longitudinal axis of said rocket for intercepting said laser beam and a target for receiving the reflected laser beam off-axis with respect to said rocket axis, said target including a plane showing the effect of the laser beam thereon and a detector assembly positioned behind said plane for producing analog signals to locate the position of the energy so that the rocket's attitude can be determined.

4,123,169

DEVICE FOR MEASURING THE WIDTH OF TIMBER

Heikki Merilläinen, Karhula, and Ulf J. G. Ström, Grankulla, both of Finland, assignors to A. Ahlstrom Osakeyhtio, Finland

Filed Feb. 14, 1977, Ser. No. 768,402
Claims priority, application Finland, Feb. 20, 1976, 760438
Int. Cl.² G01B *11/02*
U.S. Cl. 356—167 **5 Claims**



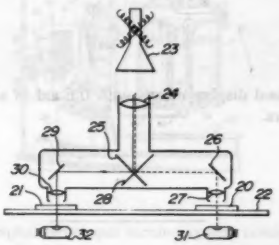
1. A device for measuring the width of a board, which comprises a laser tube emitting a beam of laser radiation; a rotating mirror means positioned so as to receive said laser beam and to impart a scanning motion thereto; optical reflector means so positioned that said rotating mirror means is at the focal point of the reflector means and that the reflector means reflects the laser beam from the rotating mirror means in a direction along said board; to scan the laser beam laterally there across; a plurality of mirror rasters positioned as mirror groups successively at predetermined spaced intervals along the length of the board at a certain distance therefrom and at a given angle so as to reflect the laser beam coming from the reflector means onto parts of the board that are situated stepwise in the lateral direction of the board; and a plurality of detectors including at least one detector at each of said intervals as defined by said group of mirrors, and arranged to receive laser pulses reflected from the board surface, to thereby provide information about the board width at said interval.

4,123,170

APPARATUS FOR DETECTING DEFECTS IN PATTERNS

Yasushi Uchiyama, Yokohama, and Daikichi Awamura, Kawasaki, both of Japan, assignors to Nippon Jido Seigyo, Ltd., Kawasaki, Japan

Filed Dec. 1, 1976, Ser. No. 746,584
Claims priority, application Japan, Nov. 26, 1975, 50-141394
Int. Cl.² G01B *11/00*
U.S. Cl. 356—167 **10 Claims**



1. An apparatus for detecting defects in patterns, particularly defects in chip patterns of photomasks used in manufacturing semiconductor integrated circuits comprising means for producing a scanning light spot;

an optical system for projecting said scanning light spot simultaneously onto identical portions of two patterns to be compared with each other;

first and second photoelectric converters each for receiving the light spot passing through or reflected from a respective pattern to produce an output electrical signal; and

electric circuit means for receiving the output signals from the first and second photoelectric converters and subtracting one of the output signals from the other to produce an output defect signal representing detected defects in the patterns; said circuit means comprising:

a subtracting circuit for producing a difference signal between the two output signals from the first and second photoelectric converters,

a delay circuit for delaying the difference signal for a predetermined time period so as to remove pseudo-defects from the output defect signal, and

circuit means for receiving the delayed difference signal and the non-delayed difference signal and processing them to produce the output defect signal having pseudo-defects deleted therefrom.

4,123,171

DENSITY MEASURING DEVICE

Masahiko Kato; Hisao Katogi, both of Kodaira, and Ikuo Seki, Tokyo, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1976, Ser. No. 723,895
Claims priority, application Japan, Sep. 22, 1975, 50-113695
Int. Cl.² G01J *3/50*
U.S. Cl. 356—175 **12 Claims**

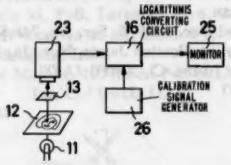
1. A measuring device for measuring the optical density of an object comprising:

scanning means for scanning said object to produce an optical density signal relating to the optical density of the scanned object;

display means responsive to said optical density signal for displaying said optical density signal in graphic form on said display means; and

marker signal generating means responsive to said scanning means and independent of said optical density signal for generating a signal to produce a plurality of calibration markers on said display means in a predetermined relation-

ship to said optical density signal so that the measurement of the displayed optical density signal can be read directly



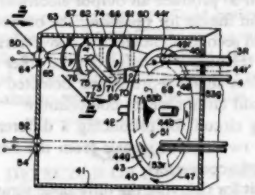
from said display means with the aid of said calibration markers.

4,123,172

COMPARISON TYPE COLORIMETER

Park French, Aurora, Ohio, assignor to Sterndent Corporation, Mount Vernon, N.Y.

Filed Sep. 7, 1976, Ser. No. 721,107
Int. Cl.² G01J *3/50*
U.S. Cl. 356—188 **18 Claims**



1. A system for directing two different light beams onto substantially the same portion of the surface area of a photosensor, comprising:

focusing means for focusing light onto a portion of the surface area of the photosensor, said focusing means comprising a lens positioned about one focal length from said photosensor,

first collimating means for substantially collimating a first beam of light and directing the same to said focusing means,

second means positioned in the path of at least part of said first beam for directing generally coaxially with said first beam, a second beam of light along a path in common with the path of said first beam of light to said focusing means, and

chopper means for cyclically alternately passing light to said respective first and second means for directing,

whereby said focusing means sequentially focuses each of said first and second beams of light onto substantially the same portion of the surface area of the photosensor,

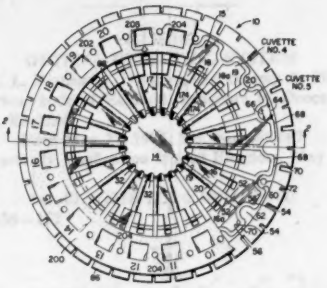
said first means for directing including means for supplying said first beam of light to said focusing means in a path having a relatively large cross-sectional area, and said second means for directing including means for directing said second beam of light to said focusing means as substantially collimated light having a relatively small cross-sectional area.

4,123,173

ROTATABLE FLEXIBLE CUVETTE ARRAYS

Frederick C. Bullock, Towaco, N.J.; Alvin Engelhardt, Nanuet; Thomas J. Cirincione, Flushing, both of N.Y., and Joseph A. Williams, Wayne, N.J., assignors to Electro-Nucleonics, Inc., Fairfield, N.J.

Filed Jun. 9, 1976, Ser. No. 694,303
Int. Cl.² G01N *1/10*
U.S. Cl. 356—246 **13 Claims**



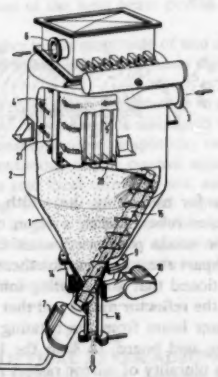
1. A cuvette array for a centrifugal analyzer, said array comprising a plurality of compartments circumferentially spaced about a central point, said array is disposable and is formed from upper and lower discs of flexible thermoplastic material, said lower disc is formed with said compartments, and said upper disc is bonded to said lower disc and closes off at least a portion of each of said compartments.

4,123,174

MIXER

Hans-Joachim Titus, Katzenpfad 4, 6148 Heppenheim, Germany

Filed Jun. 17, 1977, Ser. No. 807,548
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627259
Int. Cl.² B01F *7/00, 13/02*
U.S. Cl. 366—102 **9 Claims**



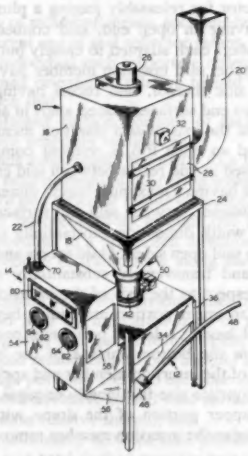
1. A mixer, comprising:

(a) a mixing vessel with one end larger than the other, at least part of said mixing vessel having a wall of conical configuration, the larger end facing upwardly, the other end being a bottom end, said mixing vessel including a vertical axis;

(b) product outlet means in said vessel adjacent the bottom end thereof;

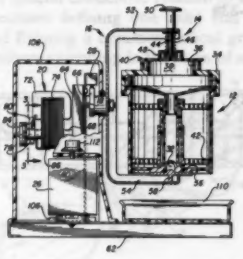
(c) a mixing worm in said vessel, said mixing worm having a longitudinal axis;
(d) means for rotating said mixing worm about said longitudinal axis;
(e) means for driving said mixing worm such that said axis thereof moves in a circular motion along said vessel wall of conical configuration;
(f) said mixing worm being so disposed as to enter said mixing vessel from said bottom end of said vessel;
(g) a flanged opening in said vessel adjacent said product outlet;
(h) a bearing housing sealingly engaging said flanged opening of the mixing vessel from below;
(i) said bearing housing having a downwardly extending product outlet tube; and
(j) a rotatively driven mount which turns around the vertical axis of said vessel, said mount supporting said bearing housing.

4,123,175
POWDER HANDLING SYSTEM
C. Burton Carlson, 400 Country Rd., Guilford, Conn. 06437, and Ernest R. Hughes, 47 Tackora Trail, Ridgefield, Conn. 06877
Filed Jul. 27, 1977, Ser. No. 819,549
Int. Cl.[2] B01F *15/00*
U.S. Cl. 366—151 10 Claims



1. A powder handling system comprising:
at least one enclosure defining therewithin collecting, loading and mixing chambers, said collecting and loading chambers being in gas-flow communication with one another and each being in powder-flow communication with said mixing chamber, said enclosure having an inlet for admitting airborne powder into said collecting chamber, an outlet for the withdrawal of powder from said mixing chamber, and a displaceable portion therein permitting entry into said loading chamber; valve means for controlling gas flow between said collecting and loading chambers; and means for creating a vacuum within said collecting chamber, whereby, in operation of said system, powder may be drawn into said collecting chamber and discharged from said mixing chamber, and whereby the supply thereof may be replenished during such operation by placing a fresh charge of powder within said loading chamber while said valve means is so controlled as to establish a vacuum therein.

4,123,176
PHOTOGRAPHIC DEVELOPER TURNING SYSTEM
Raymond H. Barker, 181 Cedarcrest La., Lewisville, Tex. 75067
Filed Oct. 21, 1977, Ser. No. 844,320
Int. Cl.[2] B01F *9/00*
U.S. Cl. 366—166 10 Claims



5. A photographic developer turning system connected to a power source, comprising:
a cylindrical film processing container dimensioned to retain exposed photographic film therein for processing;
a clamping means disposed about said container, adapted to rotate said container about an axis substantially perpendicular to the axis of said container;
an electric motor having a shaft, said shaft mechanically coupled to said clamping means and adapted to rotate said means about an axis substantially perpendicular to the axis of said container;
a cam mounted on said clamping means adapted to rotate therewith;
a mechanical switch capable of being opened by said cam for interrupting the supply of power to said motor after one rotation of said cam;
a time delay switch connected to said mechanical switch, capable of energizing said motor after a preselected time;
means for resetting said time delay switch to zero after said mechanical switch is opened by said cam;
braking means for smoothly braking the rotation of said motor when said cam opens said mechanical switch; and
means for disengaging said braking means from said motor when said motor is energized.

4,123,177
TRAY ROCKER DEVICE
Neill K. Banks, Jr., Gloucester, Mass., assignor to Bomco, Inc., Gloucester, Mass.
Filed May 25, 1977, Ser. No. 800,221
Int. Cl.[2] B01F *13/00*
U.S. Cl. 336—239 9 Claims

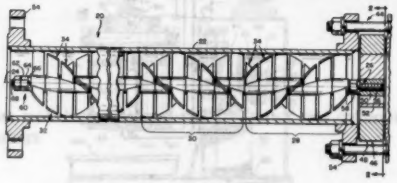
1. A tray rocker comprising a one-piece structure formed from a sheet-form structural material, said structure comprising:
a shallow U-shaped central portion;
tray support elements extending substantially horizontally from the ends of said U-shaped central portion, said support elements together defining a support platform to
an upturned lip member formed across each said tray support element, said lip members together defining means to engage a tray received by said support platform.

4,123,178

IN-LINE BLENDER

Ronald N. Salzman, and Norman R. Herbst, both of Rochester, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,872
Int. Cl.[2] B01F 5/00
U.S. Cl. 366—338 **26 Claims**



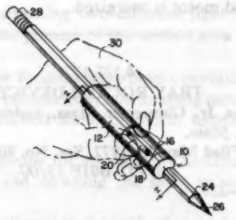
1. A device for mixing a fluid comprising:
(a) a conduit having a hollow interior disposed about a central axis; and
(b) means for mixing a fluid including a plurality of stationary mixing stages extending in series along said axis within said conduit, each of said mixing stages defining a plurality of spiral channels within the hollow interior of said conduit, said spiral channels extending the entire length of each of said mixing stages, each of said mixing stages including a plurality of distinct segments extending in series along said axis, one of said mixing stages defining a plurality of spiral channels which rotate in a first angular direction, and another of said mixing stages defining a plurality of spiral channels which rotate in a second angular direction opposite to said first angular direction.

4,123,179

ORTHOPEDIC FINGER PIECE FOR WRITING INSTRUMENTS

Nelly M. Pacheco, 102 Woodland Ct., Carpentersville, Ill. 60110

Filed Jan. 5, 1977, Ser. No. 756,824
Int. Cl.[2] A46B 5/02
U.S. Cl. 401—6 **3 Claims**



1. Apparatus adapted to fit over an elongated writing instrument to protect fingers and aid in holding such writing instrument comprising a semi-resilient sleeve having a bore extending along the longitudinal axis thereof, said bore having a diameter substantially of the same configuration as the diameter of a writing instrument on which said sleeve is mounted through said bore, the diameter of said bore being sufficiently wide to allow said sleeve to be moved longitudinally along the length of such an elongated writing instrument, said sleeve having writing instrument securing means thereon for holding said sleeve in one position along the length of such a writing instrument, said securing means being engageable and disengageable with such a writing instrument positioned in said sleeve, said securing means comprising a lever pivotally mounted on a pivot axle, said pivot axle being secured to said sleeve substantially transverse to the longitudinal axis of said sleeve, said lever having a cam lobe at the end thereof extending through an opening in said sleeve, said cam lobe being arranged to grippingly engage the surface of a writing instrument when said sleeve is positioned thereon and when said lever is substantially parallel to the longitudinal axis of said sleeves, said cam lobe being arranged to substantially disengage the surface of such a writing instrument when said lever is pivoted about said pivot axle to a position substantially normal to the longitudinal axis of said sleeve.

4,123,180

TUBE CONNECTOR

Roland E. Nehma, 80 Roger Pilon St.,, Dollard des Ormeaux, Montreal, Quebec, Canada

Filed Jun. 11, 1976, Ser. No. 695,155
Claims priority, application Canada, Aug. 12, 1975, 233299
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—172 **25 Claims**

9. A connector for releasably joining a plurality of hollow tubes each having an open end, said connector comprising insertion members each adapted to closely but slidably fit into one end of a tube, said insertion member having at least one recess in the side thereof, said recess having a flat bottom surface and two end surfaces spaced apart in an axial direction with respect to the axis of said insertion member and having open sides and an open top, a resilient compressible spring member disposed in said recess between said end surfaces, said spring member having a maximum length dimension essentially equal to the distance between said end surfaces of said recess and having a width dimension substantially equal to the distance between said open sides of said recess and a dome arched both axially and transversely substantially along its entire length with respect to the axis of the insertion member, said dome having an upper portion protruding beyond the top of the recess and having a lower peripheral portion defining a base resting on the bottom surface of the recess, whereby forcible entry of the insertion member and spring member into a tube of appropriate size frictionally engages the arched surfaces of the upper portion of the dome with the tube and frictionally retains the insertion member removably in place in the tube.

4,123,181

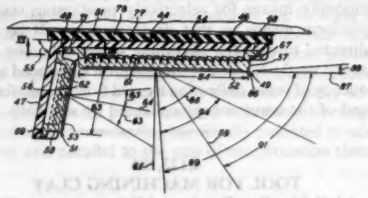
ROADSIDE BARRIER MARKER SYSTEM

Arthur P. Schueler, Schaumburg, and Robert I. Nagel, Skokie, both of Ill., assignors to Astro Optics Corporation, Schaumburg, Ill.

Filed Dec. 2, 1977, Ser. No. 856,967
Int. Cl.[2] E01F 9/00
U.S. Cl. 404—9 **21 Claims**

1. In a roadway construction of the type having generally longitudinally extending road surface portions within roadside edge portions, the improvement which comprises
(A) a plurality of individual retroreflective reflector means, each individual one of said reflector means
(1) having at least two regions which are each retroreflective of incident light, and each such region has one flattened exterior surface portion which respective such surface portions are inclined relative to one another,
(2) said two regions thereof being colored white, red, amber, or blue,

(3) said two regions thereof together further being continuously retroreflective of incident light rays striking the surface portions thereof over a predeterminable included angle of at least about 60° but less than 90° measured relative to said one flattened surface portion,



(4) the retroreflected light from any one of said reflector means at any given location within such included angle thereof having a minimum specific intensity value for retroreflectivity which is at least that shown in the following table:

Color of said regions	Specific intensity in candelas per foot candle
white	20
red	5
amber	12
blue	5

(B) a plurality of mounting means, each one being associated with a different one of said reflector means, for holding its associated individual such respective reflector means in a predetermined orientation relative to said roadside edge portions such that

(1) said flattened surface portions of each of said two regions are generally vertical, and

(2) 0° extends substantially parallelly to a tangent to said roadside edge portions in the region where each respective one of said reflector means is located, and the angle of 60° of retroreflectivity extends out into said road surface portions in a prechosen direction relative to a given direction of traffic flow along said road surface portions,

(C) the relationship between individual ones of said reflector means as so held by individual ones of said mounting means being such that said reflector means are in longitudinally spaced relationship to one another relative to said roadside edge portions, and also each one of said reflector means is located relative to said road surface portions in a similar position relative thereto, and

(D) the interrelationship between such plurality of reflector means and said road surface portions being such that the driver of a vehicle moving along said road surface portion at night, said vehicle being equipped with head light means, continuously sees each individual reflector means of said plurality within a viewing angle of at least from 0° to 60° but less than about 90° where 0° and 60° are as defined above.

4,123,182

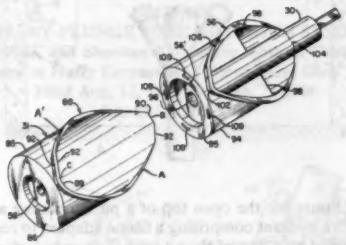
CAM DRIVE FOR MATRIX PRINT HEADS AND THE LIKE

Nicholas Kondur, Jr., Riverton, Wyo., assignor to LRC, Inc., Riverton, Wyo.

Filed May 17, 1976, Ser. No. 686,708
Int. Cl.² B41J *19/50, 19/56, 19/20*
U.S. Cl. 400—328 **13 Claims**

1. In a printing apparatus having a frame, a print head including a drive member therefor, said print head adapted to impress numbers or other indicia on a record medium, the improvement comprising:

print head drive means engageable with the drive member on said print head to reversibly drive said print head in a print and return direction, said drive means including an elongated drive axle mounted for rotation on said frame, a substantially hollow, axially elongated drum segment having a pair of closely spaced generally helically extending rib members forming a cylindrical surface of revolution in outer spaced concentric relation to said drive axle, said rib members defining one axial end of said drum segment and forming a common helical groove between said rib members extending in the form of an endless loop



between first and second points 180° removed from one another adjacent to opposite ends of said drive axle, a rigid support member extending between said drum segment and said drive axle to support said drum segment in outer concentric relation to said drive axle, and

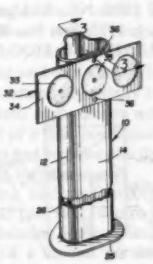
motor drive means for rotating said print head drive means whereby engagement of said drive member by said loop will impart linear, reversible movement to said print head as said drive member advances throughout a complete cycle of revolution of said loop.

4,123,183

GUIDEPOST FOR ROADWAYS AND THE LIKE

John E. Ryan, 18113 Mt. Washington St., Fountain Valley, Calif. 92708

Filed Aug. 29, 1977, Ser. No. 828,743
Int. Cl.² E01F *9/00*
U.S. Cl. 404—10 **8 Claims**



1. A guidepost structure, the combination comprising an elongated, tubular-body member of pliable plastic material, and said member having:

a front wall of substantial width;

a rear wall; and

a pair of side walls having a sinusoidal configuration, said side walls integrally connecting said front and rear walls;

wherein said front wall is substantially flat throughout the length thereof, and said rear wall is semi-circular throughout its length thereof;

said front wall, said side walls, and said rear wall defining a "T"-shaped, horizontal, cross-sectional configuration; and

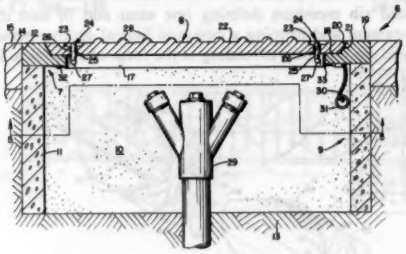
wherein said elongated tubular body includes a memory factor whereby any distortion of said walls will slowly be corrected so that they can attain their original contour.

4,123,184

UNDERGROUND FIRE HYDRANT FRAME AND COVER

Leslie A. Whitlock, 510 Scenic Dr., Modesto, Calif. 95350

Filed Jan. 12, 1978, Ser. No. 868,870
Int. Cl.[2] E02D 29/14
U.S. Cl. 404—25 4 Claims



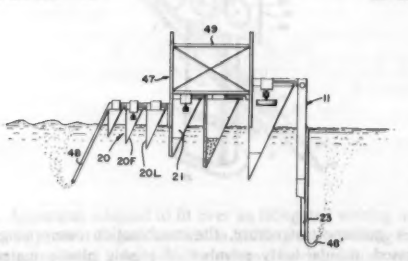
1. A closure for the open top of a pit containing an underground fire hydrant comprising a frame adapted to rest on and be supported by a part of the pit with the upper surface of said frame flush with a surrounding highway surface, said frame having a large opening and a recessed upper surface surrounding said opening, and a cover having a marginal portion shaped to fit in said recessed portion of the frame for closing the frame opening, said cover being of a thickness such that its upper surface is disposed substantially flush with the upper surface of the frame when the cover is supported by the frame, an electric heating element secured to the underside of the frame around the opening thereof for heating the frame and cover to prevent the accummulation of ice and snow on the upper surface thereof, and said frame having a depending lip surrounding the opening and disposed between said heating element and the opening to protect the heating element from moisture draining through the opening.

4,123,185

FLOATING BREAKWATER AND ENERGY COLLECTING SYSTEM

Alf R. Hagen, 16249 36th Ave., NE., Seattle, Wash. 98155, and Eric C. Hagen, 11223 109th NE., Kirkland, Wash. 98033

Filed Jun. 6, 1977, Ser. No. 803,543
Int. Cl.[2] E02B 9/08; F03C 1/26
U.S. Cl. 405—76 10 Claims



1. A combination floating breakwater and energy collector comprising:

floating platform means having a front side and a lea side, and containing a plurality of wave energy collection means arranged to receive waves advancing generally toward said front side,

said collection means comprising collection chambers open to the bottom and each having a relatively vertical back wall and a sloped front wall sloping in the lea direction from the bottom for receiving waves, said collection chambers being arranged in a plurality of rows located side-by-side from said front side to the lea side of the floating platform means, and being progressively larger in width and depth from the frontmost row to the leemost row,

converting means on said platform means for converting the wave energy collected at said cells into a transmittable form of energy, and

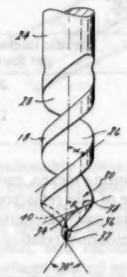
positioning means for selectively positioning said floating platform means so that its front side will be generally directed toward the oncoming waves whereby the wave action on the lea side of the platform is reduced as a consequence of wave deflection by said floating platform means and of the wave energy collected by said cells.

4,123,186

TOOL FOR MACHINING CLAY

Frederick E. Hoadley, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 6, 1977, Ser. No. 794,585
Int. Cl.[2] B26D 1/12
U.S. Cl. 407—54 4 Claims



1. A milling cutter for machining soft material such as clay comprising a cylindrical shank adapted for rotation about its axis, flutes formed in said shank in the form of spirals extending along the axis of said shank, the tip of said shank being ground with an angle to form a point the apex of which falls substantially on the axis of said shank, each flute having a cutting edge ground on the side of the flute in the region of said tip, each cutting edge thereby having a lead-in surface that has an effective angle β relative to the axis of said shank that is greater than the corresponding angle α formed by the spiral flutes, the ground surface adjacent the cutting edge progressively decreasing in width as the cutting edges converge toward the tip of said tool.

4,123,187

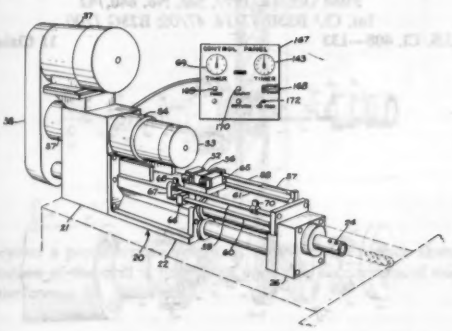
PECK-DRILLING APPARATUS FOR QUILL FEED UNITS

Frank W. Turner, 70 Sylvan, Pleasant Ridge, Mich. 48069

Division of Ser. No. 309,957, Nov. 28, 1972, Pat. No. 3,955,629.
This application May 5, 1976, Ser. No. 683,334
Int. Cl.[2] B23B 27/22, 47/18
U.S. Cl. 408—17 15 Claims

1. An improvement in a mechanical quill feed unit of the type having a frame member, a tool quill of the type adapted for reciprocative movement with respect to said frame member and having electro-mechanical tool rotating means, electromechanical means to rapidly advance a tool toward a workpiece preparatory to performing a machining operation thereon, to slowly advance the tool while said machining operation is taking place and to rapidly retract said tool at the conclusion of said machining operation, the improvement comprising a peck-drilling apparatus including means to cause said electro-mechanical rapid advance means to advance the tool quill to a predetermined adjustable starting position and to thereupon turn off said electro-mechanical rapid advance means upon reaching said starting position, electro-mechanical means to

feed said tool quill at a slow feed rate until the expiration of a predetermined time interval, electro-mechanical means to return said tool quill to its original starting position immediately after the expiration of said time interval, and to immediately rapidly advance it to its position at the expiration of said time interval to reflect the advance of said tool quill during said time interval, and to repeat the peck-drilling cycle until the desired depth of cut, as represented by the forward movement of the tool quill is reached, and electro-mechanical means to thereupon return said tool quill to its original position to await the beginning of another cycle, said electro-mechanical means to cause said rapid advance means to rapidly advance said tool quill to said predetermined adjustable starting position including a cam mounting bar fixedly mounted to said tool quill on an axis parallel to the axis of reciprocation thereof in



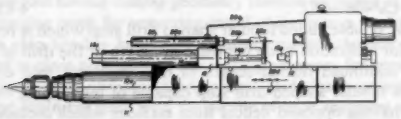
close proximity to said frame member, a special slideable cam mounted for movement along said cam mounting bar, a mounting block fixedly mounted to said frame member and having a plurality of guideways therein parallel to said cam mounting bar, with said cam mounting bar passing through one of said guideways, a slideable cam mounted in at least one other of said guideways and adapted for movement by said special slideable cam and having a recessed portion therein, a first limit switch mounted perpendicular to said slideable cam and being adapted to be operated by said recessed portion, said limit switch being operably connected to said rapid advance means and being adapted to rapidly advance said tool quill until said special slideable cam contacts and moves said slideable cam and causes said first limit switch to turn off said rapid advance and reactivate said feed means for said predetermined time.

4,123,188

CONTROL SYSTEM FOR PECK DRILLING TOOL

Edwin J. Deremo, and Hans P. Olving, both of Spring Lake, Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Apr. 4, 1977, Ser. No. 784,348
Int. Cl.² B23B *47/34*
U.S. Cl. 408—17 **10 Claims**



1. In a control system for a drill wherein a drill bit mounted on a feed mechanism is advanced at an advance travel rate in successively increasing steps to machine successive work faces in a work piece, and retracted between each step to remove cuttings, the combination which comprises:

(a) feed rate control means for engaging the feed mechanism when said drill bit is a predetermined distance from each successive work face to decrease the advance travel rate before said bit contacts the work piece, said feed rate control means being mechanically biased away from the work piece and being operable to retract to follow the retractive travel of the drill bit for a predetermined travel, and

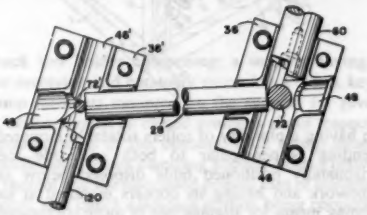
(b) means operable in response to initiation of each drill bit retraction for generating a force increasing with time to arrest the retraction of said control means before said drill bit is fully retracted to limit the retraction of said control means to the predetermined travel.

4,123,189

ROTARY-PLUNGE TUBE NOTCHING SYSTEM

Louis Ferlise, and Sherman E. Mackey, both of Celina, Ohio, assignors to Huffy Corporation, Miamisburg, Ohio

Filed Aug. 12, 1976, Ser. No. 713,908
Int. Cl.² B27C *3/00*
U.S. Cl. 408—21 **10 Claims**



1. Tube notching apparatus comprising:

a die including a tube receiving passage and a tool receiving passage,

said passages intersecting and crossing each other at an intersection thereof with portions of each of said passages extending in opposite directions from said intersection,

stop means projectable into said intersection of said tube and tool receiving passages for engaging an edge of an end of a tube as a tube moves through said tube receiving passage into said intersection to position an end of a tube at said intersection,

a tool rotatably and slidably received in said tool receiving passage,

said tool including a rotary cutting edge extending substantially axially of said tool and engageable with an edge of an end of a tube positioned at said intersection,

means for rotating said tool about a longitudinal axis thereof to bring said substantially axially extending rotary cutting edge thereof into engagement with a first portion of an edge of an end of a tube positioned at said intersection by said stop means and remove of a first segment of said tube,

a plunge shearing surface,

means for moving said tool axially thereof through said intersection and past said tube receiving passage to bring said plunge shearing surface into engagement with an inner surface of a second portion of an end of a tube positioned at said intersection and remove a second segment thereof opposite said first segment, and

means for moving said stop means into said intersection to position a tube thereat and out of said intersection prior to said axial movement of said tool through said intersection.

4,123,190

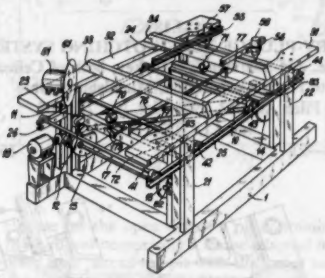
APPARATUS FOR PREPARING CORRUGATED SHEETS AUTOMATICALLY

Jean C. Baudot, Rue du Moulin de l'Arche, Saint-Fargeau, Yonne, France

Filed Oct. 6, 1976, Ser. No. 729,888
Claims priority, application France, Oct. 9, 1975, 75 30927
Int. Cl.² B23B *51/08*
U.S. Cl. 408—25 **6 Claims**

1. Apparatus for preparing corrugated sheets, which com-

prises a first rectangular framework having a pair of spaced apart vertical columns disposed at each of the four corners of said framework, each pair of columns forming a guideway and bearing a horizontal structure having affixed thereto a plurality of cutting and drilling tools which are adjustable in position; a second framework disposed in the guideway for supporting one or more corrugated sheets, said second framework comprising a pair of side members extending parallel to each other, each side member passing through each of the guideways formed by two adjacent pairs of columns, said side members



also having a plurality of rollers rotatably mounted upon and extending perpendicular to both said side memebers; a horizonatally positioned table disposed below said second framework and having its corners mounted at said vertical columns; means for aligning one or more corrugated sheets fed into the apparatus in a position to engage said tools, said means being attached to the upper surface of said table and mounted in spaced relationship from said second framework; and displacement means attached to said first framework to vertically displace said table and said horizontal structure towards and away from each other to form prepared corrugated sheets.

4,123,191

MULTI-SPINDLE DRILL HEAD

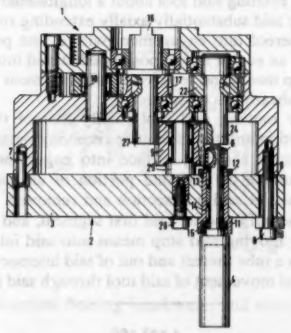
Erwin Braun, Stuttgart, Germany, assignor to Sigloch and Schrieder, Germany

Filed Jul. 25, 1977, Ser. No. 818,751

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1976, 2633660

Int. Cl.² B23B *47/14, 39/16*

U.S. Cl. 408—42 **12 Claims**



1. A multi-spindle drill head for use with a machine drive, comprising a main assembly, including a first housing member, at least one main spindle rotatably supported on said first housing member and having an end adapted to be connected to the machine drive for rotation thereof, gear means defining at least one secondary drive pinion rotatably mounted on said first housing member and connected to said main spindle for rotation thereby, a second housing member, a connecting gear rotatably mounted on said second housing member, at least one drill spindle rotatably mounted on said second housing member and engaged with said connecting gear, and means for securing said second housing member to said first housing member in an orientation to position said connecting gear in driving engagement with said secondary drive pinion to drive said connecting gear from said drive pinion along with said drill spindle, said gear means defining said at least one secondary drive pinion comprising said main spindle having a drive pinion formed thereon, and a plurality of secondary spindles, each having a spindle gear engaged with said main spindle.

4,123,192

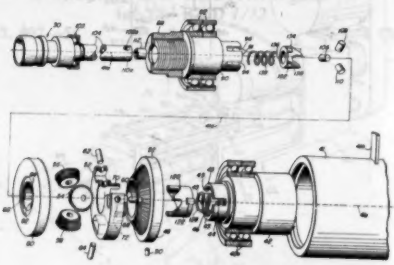
TAPPING ATTACHMENT FOR A MACHINE TOOL

Frederick W. Ruland, 59 Lincoln St., Waltham, Mass. 02154

Filed Oct. 11, 1977, Ser. No. 840,742

Int. Cl.² B23B *47/14, 47/00*; B23G *1/00*

U.S. Cl. 408—133 **11 Claims**



1. A tapping attachment for coupling a tapping tool to a machine, said machine including one or more tool drive shafts and associated workpiece spindles, and further including means for driving at least one of said tool drive shafts and its associated spindle in a rotary motion in the same direction about a reference axis, said tapping attachment comprising:

means for coaxially coupling said tool to said one drive shaft and to selectively rotate said tool at one of two rotational velocities about said axis in the same direction as said one drive shaft and its associated spindle, said rotational velocity of said tool being lower than that of said spindle when said tapping tool is biased with respect to said drive shaft along said axis in a first direction, and being higher than that of said spindle when said tapping tool is biased with respect to said drive shaft in the opposite direction along said axis.

4,123,193

DOUBLE ENDED DRILL STOP

Horace E. Hill, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 17, 1976, Ser. No. 751,566

Int. Cl.² B23B *47/00*

U.S. Cl. 408—202 **4 Claims**

1. A double ended tubular shaped drill stop which is reversible for utilization upon decrease in length of the drill to provide continued further length of drill exposure, said double ended tubular shaped drill stop capable of telescoping over a drill having opposed helical flute surfaces which include run out ramp portions extending between the maximum depth portions of said flute surface and the other surface shank portion of the drill, said double ended tubular shaped drill stop including an inner protruding surface portion of the inner wall of said double ended tubular shaped drill stop disposed off center with respect to the longitudinal length thereof and extending from said inner wall of said double ended tubular shaped drill stop into at least one of the said helical flute surfaces and providing clearance fit therewith along said maxi-

mum depth portions and further providing an interference fit with respect to said run out ramp portions so that any further telescoping of said double ended tubular shaped drill stop

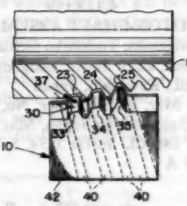
beyond a predetermined position up the outer surface shank portion of the drill is prevented upon the occurrence of said interference fit.

4,123,194

PROFILED CHIP BREAKER

Lawrence E. Cave, Painesville, Ohio, assignor to PMC Industries, Inc., Wickliffe, Ohio

Filed Jun. 27, 1977, Ser. No. 810,490
Int. Cl.[2] B23B *51/00*; B26D *1/12*
U.S. Cl. 408—221 **4 Claims**



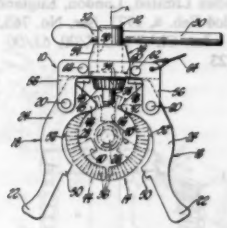
1. A metalworking apparatus comprising, in combination, a cutting tool having cutting geometry thereon including at least two cutting teeth for removing metal chips from a workpiece and a chip breaker having an abutment surface thereon positioned in close proximity to the cutting geometry for breaking the metal chips directed thereagainst, said abutment surface having abutment teeth with the profile of each abutment tooth being the same as the cutting tooth aligned therewith to provide a uniform space therebetween across each such respective pair of aligned cutting and abutment teeth, said uniform space between respective pairs of aligned cutting and abutment teeth potentially varying from one pair to the next across the cutting geometry in accordance with the amount of chips being respectively removed by each cutting tooth, with a relative increase in chip removal by a particular cutting tooth requiring an increase in the uniform space at that cutting tooth, and vice versa.

4,123,195

CHUCK KEY HOLDER

John R. Purviance, 29530 Highmeadow Rd., Farmington Hills, Mich. 48024

Filed Oct. 11, 1977, Ser. No. 840,682
Int. Cl.[2] B23B *39/00*
U.S. Cl. 408—241 R **8 Claims**



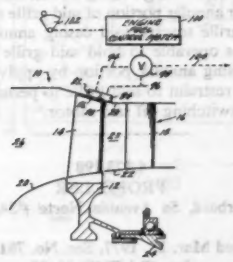
1. A chuck key holder comprising: a support having an opening for receiving and rotatably mounting a chuck key; a pair of clamp members mounted on the support for pivotal movement between open an closed positions about respective axes on opposite sides of the opening; each clamp member having a handle and a chuck clamping portion located between the handle thereof and the associated pivotal axes of movement on the support; said chuck clamping portion being cooperable in the closed position to position a drill chuck therebetween so as to securely position the chuck key for rotation in properly located spanning engagement with the chuck; each clamp member also having an ejecting portion located on the opposite side of the clamping portion thereof as the handle thereof; and means biasing the clamp members to the open position such that the ejecting portions thereof move the support away from the chuck and the chuck key out of spanning engagement therewith as the clamp members move from the closed position to the open position.

4,123,196

SUPERSONIC COMPRESSOR WITH OFF-DESIGN PERFORMANCE IMPROVEMENT

David C. Prince, Jr., and Carl C. Koch, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 1, 1976, Ser. No. 737,229
Int. Cl.[2] F01D *19/00*; F02C *00/00*
U.S. Cl. 415—181 **10 Claims**



10. In a method of operating a turbomachine having a row of blades disposed in an airflow and designed to operate at a supersonic inlet relative Mach number, and wherein each circumferentially adjacent pair of blades defines a generally convergent flow passage therebetween, the step of extracting air from the passages of an amount generally inversely related to the inlet relative Mach number, the amount of extracton at the design operating condition being substantially zero and the amount of extraction at lower inlet relative Mach numbers

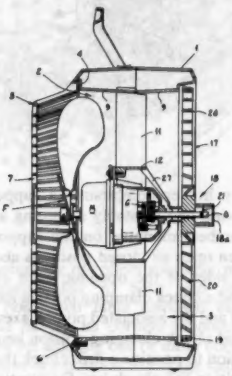
being such as to reduce the effective convergence through the passage, thereby restructuring the shock pattern.

4,123,197

FAN WITH AIR DIRECTING GRILLE

Phillip W. Keem, North Croydon; Laimons Kaimins, Forest Hill, and James Graham, Eltham, all of Australia, assignors to Allware Agencies Limited, London, England

Filed Feb. 4, 1977, Ser. No. 765,764
Int. Cl.[2] F16D *7/00, 63/00*
U.S. Cl. 415—123 **3 Claims**



1. A fan comprising a casing; a cylindrical wall defining an air passage through said casing, said air passage having an air inlet and an air outlet; a fan blade assembly mounted within said casing at the inlet end of said air passage; a motor mounted within said air passage for driving said fan blade assembly; an air directing grille mounted for rotation in the path of air flow downstream of the fan blade assembly at the air outlet; speed reducing means driven by the output of said motor opposite said fan blade assembly; a clutch mechanism coupling said speed reducing means to said grille for rotating said grille at a speed less than that of the fan blade assembly, said grille including a plurality of louvers arranged to direct the air flow in a substantially gyratory distribution pattern, said clutch having means permitting the output of said speed reducing means to continue rotation without imparting rotational movement to said grille when a predetermined restraint of rotation of said grille is applied thereto, said grille being movable axially of said casing and said casing having an annular portion engageable by an outer annular portion of said grille upon axial movement of said grille toward said casing annular portion; and retaining means operable to hold said grille annular portion against said casing annular portion by applying at least said predetermined restraint to said grille to permit locking of the grille without switching off said motor.

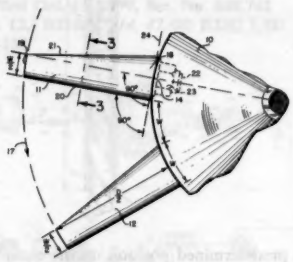
4,123,198

PROPELLER

Horace R. Harbord, 5a Avenida Norte #34, Mexicanos, El Salvador

Filed Mar. 28, 1977, Ser. No. 781,629
Int. Cl.[2] F04D *29/38*
U.S. Cl. 416—243 **4 Claims**

1. A propeller including, in combination:
(a) a central imperforate hub having a given hub diameter; and,
(b) a plurality of blades greater than two having roots and tips connected by straight line leading and trailing edges, said roots being secured to equal circumferentially spaced points on the periphery of said hub, each blade extending radially from its root connection on the hub to its tip a distance equal to one half said given diameter of the hub so that the circular locus of the blade tips is of a diameter equal to twice the diameter of said hub, and wherein further:
(1) the width of each blade at its root is equal to the spacing measured circumferentially along the periphery of the hub between adjacent blades,
(2) the straight leading edge of each blade being normal to a line tangential to the periphery of said hub at the point of securement of the root of the blade,
(3) the width of the tip of each blade being one half the width of the root such that the straight trailing edge of each blade defines a tapered blade decreasing uniformly in width from its root to its tip,



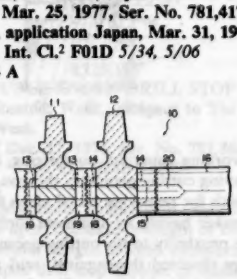
(4) the major portion of the cross section of each blade taken along its width dimension having a camber defined by an upper curved line convex when viewed from the top of a first given radius of curvature and a lower curved line concave when viewed from the bottom of a second given radius of curvature greater than said first given radius of curvature, and
(5) the angle of attack of the cord each blade being uniform from root to tip and having a value from 10° to 17° whereby when said propeller is rotated, a substantially constant air discharge from the roots to the tips of the blades is realized with a substantial elimination of radial air flow.

4,123,199

ROTOR-SHAFT ASSEMBLY

Syogo Shimizu, Chigasaki; Toshihiko Ochiai, and Masato Sakai, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 25, 1977, Ser. No. 781,417
Claims priority, application Japan, Mar. 31, 1976, 51-34416
Int. Cl.[2] F01D *5/34, 5/06*
U.S. Cl. 416—244 A **7 Claims**



1. A rotor-shaft assembly comprising:
a ceramic turbine rotor;
a connector member comprising a columnar or cylindrical body of metal having first and second ends, the first end being co-axially joined to the ceramic turbine rotor; and
a metal shaft co-axially joined to the second end of the connector member by mutual engagement of teeth provided at the ends of the connector member and the metal shaft.

4,123,200
GAS-DYNAMIC PRESSURE-WAVE MACHINE

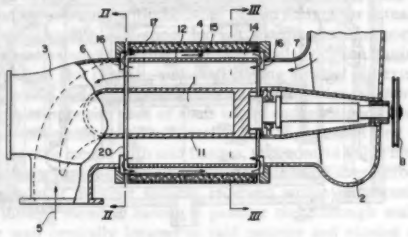
Hansulrich Hörler, Zurich, and Josef Perevuznik, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 15, 1975, Ser. No. 541,247

Claims priority, application Switzerland, Feb. 14, 1974, 2088/74

Int. Cl.² F04B *11/00*

U.S. Cl. 417—64 **5 Claims**



1. In a gas-dynamic pressure-wave machine comprising essentially a celled rotor including a cylindrical shroud forming the radially outer wall of the cells and operating within a stationary casing that includes a cylindrical middle portion co-extensive in length with and surrounding said shroud and two side casing portions located respectively adjacent opposite ends of said rotor for entrance and discharge of a hot gas to be expanded and a cold gas such as air to be compressed respectively which flow through the cells whereby some of the energy in said hot gas is imparted to said cold gas to cause the latter to be compressed accompanied by heating of said rotor and axial expansion thereof, the improvement wherein to prevent any rubbing action between the surfaces of said side casing portions and the opposite ends of said rotor as a result of its axially directed thermal expansion and yet maintain a desirable small axial operating clearance therebetween, the internal diameter of said cylindrical middle portion of said casing exceeds the external diameter of said shroud by an amount sufficient to establish an axially extending annular flow channel therebetween through which said hot gas flows from one end of said middle casing portion to the other thereby heating the latter for each operating condition approximately simultaneously with said rotor to a temperature which is at least approximately proportional to the average rotor temperature at that operating condition, and said machine includes at least one recess in each of said two side casing portions through which the said hot gas flows to or from said axially extending flow channel.

4,123,201
MODULAR VACUUM PUMP ASSEMBLY

Vytautas Andriulis, Chicago, Ill., assignor to Central Scientific Company, Inc., Chicago, Ill.

Filed Sep. 4, 1973, Ser. No. 394,092

Int. Cl.² F04B *23/10, 17/00, 35/04;* F16D *3/14*

U.S. Cl. 417—204 **2 Claims**

1. A rotary displacement vacuum pump assembly incorporating a rotor drive motor and comprising:

a mounting plate, the rotor drive motor being mounted on one side of said mounting plate;

a pump housing mounted on the opposite side of said mounting plate;

a stator body portion with an internal cavity that provides a pumping chamber;

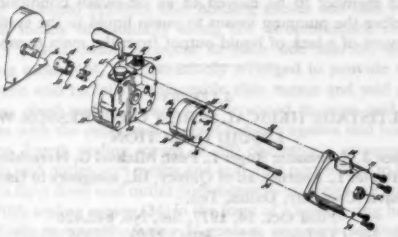
a rotor located in said pump chamber;

a pair of end plates positioned on either end of said stator body portion;

fastening means to rigidly connect said end plates to said stator body portion to form an integral modular pump assembly, said modular pump assembly having a vacuum inlet and a pressure outlet;

mounting means to releasably connect said modular pump assembly to said mounting plate within said pump housing;

a coupling collar rigidly connected to the drive shaft of the rotor drive motor, a pair of cruciform slots being formed in said collar;



a pair of cruciform slits formed in the motor end of the rotor shaft; and

an elastomeric crosspiece to fit into said slots of said coupling collar and said slits in the rotor shaft to provide a driving connection between the rotor drive motor and said rotor.

4,123,202
HYDRAULIC PUMPING ARRANGEMENTS

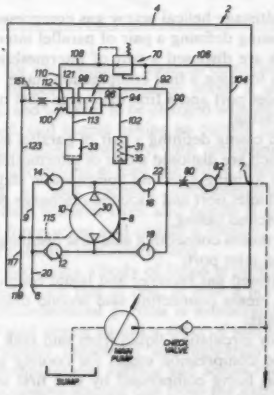
Nicholas A. James, Wotton-under-Edge; John A. Hudson, Highworth; Derek G. Savage, Swindon, and Edward G. Morley, Tetbury, all of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Nov. 3, 1976, Ser. No. 738,625

Claims priority, application United Kingdom, Nov. 4, 1975, 45724/75

Int. Cl.² F04B *49/00*

U.S. Cl. 417—216 **7 Claims**



1. A hydraulic pumping arrangement for pumping a liquid to a hydraulic system, which comprises reversible pumping means for pumping the liquid, swash means including a variable swash member which enables the liquid output of the pumping means to be infinitely varied between minimum and maximum, a first piston-and-cylinder arrangement for increasing the position of the swash member to increase the liquid output of the pumping means, a second piston-and-cylinder arrangement for decreasing the position of the swash member to decrease the liquid output of the pumping means, control

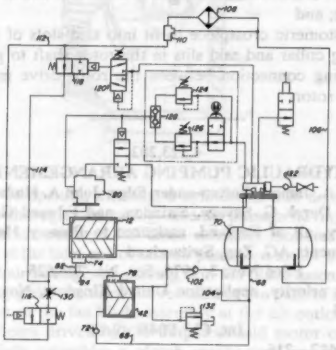
means for controlling the flow of liquid for the second piston-and-cylinder arrangement, switching means operative to pass liquid from the system to the control means at a first condition in the system and operative to stop liquid from the system passing to the control means at a second condition in the system, and valve means for isolating the pumping arrangement from the system and from a main pump normally supplying liquid to the system, the control means being operative when it is receiving liquid from the switching means to enable the swash member to be moved to an on-swash condition and therefore the pumping means to pump liquid to the system in the event of a lack of liquid output from the main pump.

4,123,203

MULTISTAGE HELICAL SCREW COMPRESSOR WITH LIQUID INJECTION

Stephen J. Kathmann; Roger L. Post; Michael G. Herschler, and Sylvester L. Anerino, all of Quincy, Ill., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Oct. 14, 1977, Ser. No. 842,426
Int. Cl.[2] F04B *39/02*; F04C *23/00, 29/08, 29/02*
U.S. Cl. 417—252 **8 Claims**



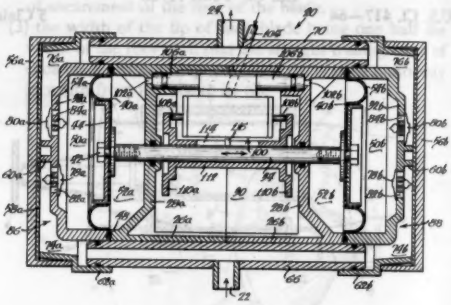
1. A multistage helical screw gas compressor comprising:
a first casing defining a pair of parallel intersecting bores in which are disposed a pair of intermeshing helical screw rotors forming a first compression stage;
a first inlet port and a first discharge port opening into said first casing;
a second casing defining a pair of parallel intersecting bores in which are disposed a pair of intermeshing helical screw rotors forming a second compression stage;
a second inlet port and a second discharge port opening into said second casing;
passage means connecting said first discharge port with said second inlet port;
a compressed gas receiver and liquid reservoir tank;
conduit means connecting said second discharge port with said tank;
means for circulating liquid from said tank to said first and second compression stages for cooling and mixing with the gas being compressed by said first and second compression stages;
a bypass conduit interconnecting said second inlet port with said tank for conducting gas compressed by said first compression stage to said tank without passing through said second compression stage; and,
a check valve interposed in said bypass conduit and responsive to a pressure differential between said second inlet port and said tank for causing compressed gas discharged from said first compression stage to be conducted directly to said tank to thereby force liquid stored in said tank to be circulated to said first and second compression stages on starting said compressor.

4,123,204

DOUBLE-ACTING, FLUID-OPERATED PUMP HAVING PILOT VALVE CONTROL OF DISTRIBUTOR MOTOR

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed Jan. 3, 1977, Ser. No. 756,495
Int. Cl.[2] F04B *17/00, 35/00*; F01L *25/02*
U.S. Cl. 417—393 **3 Claims**



1. An air operated pump for fluids, comprising a pair of pumping stages, each including housing means forming an enlarged chamber therewithin, a flexible diaphragm positioned within said chamber and dividing said chamber into a fluid pumping section and an air receiving section, a pair of one way valve means in said housing means communicating with said pumping section, one of said valve means for passing fluid into said section and the other of said valve means for passing fluid from said section, an end closure on said housing means forming therewith fluid inlet and fluid outlet chambers, said end closure having an inlet to said fluid inlet chamber for being connected with a supply of fluid and an outlet from said fluid outlet chamber, said one valve means connecting said fluid inlet chamber with said housing means chamber and said other valve means connecting said housing means chamber with said fluid outlet chamber, said housing means having an air inlet port formed therethrough into said air section; means for mounting said housing means of said pumping stages in fixed relationship; a shaft extended between and secured at its opposite ends to said diaphragms constraining said diaphragms to conjoint reciprocating movement, such that said diaphragm of one of said stages moves into said pumping section thereof when said diaphragm of said other pump moves out of said pumping section thereof, and vice versa; directional valve means operable to apply compressed air from a source thereof selectively through one or the other of said ports into said associated air receiving section to move said diaphragm therein into said associated pumping section while venting the remaining air inlet port to atmosphere, and control valve means responsive to movement of said diaphragms toward the ends of their travel to operate said directional valve means to apply compressed air alternately through said ports, whereby said pumping stage diaphragms are reciprocatingly moved into and out of said pumping sections to alternately draw fluid from said inlets to said end closures into said pumping sections through said one valve means and to then expel said fluid to said end closure outlets through said other valve means, said one way valve means being flapper valves, said directional valve means including slide valve means connected between the source of air under pressure and said ports and movable between a first position for applying said air through one of said ports and a second position for applying said air through said other port, said control valve means being connected with said slide valve means and being responsive to said diaphragms closely approaching one end of their travel to move said slide valve means to said first position and to said diaphragms closely approaching the other end of their travel to move said slide valve means to said second position, said control valve

means including first and second mechanically actuable valve means, said control valve means moving said slide valve means to said first position upon actuation of said first valve means and to said second position upon actuation of said second valve means, and means linking said first and said second valve means and said shaft upon said shaft closely approaching opposite ends of its travel for alternately actuating said first and second valve means, said linking means including a spool positioned around said shaft and having radial flanges at opposite ends thereof for engaging said valve means, said spool being movable with reciprocation of said shaft to alternately engage said first valve means with one of said flanges and said second valve means with the other of said flanges for actuating said valve means, said spool having a center tubular portion positioned around said shaft and said tubular portion having a longitudinal slot therein, said shaft having a radial pin extending into said slot and movable therein along the length thereof, said pin at opposite ends of shaft travel engaging ends of said slot to move said spool in directions to engage said first and second valve means with said flanges, said control valve means including a housing having a passage extending therethrough and a tubular member slidably received within said housing, said tubular member having a passage therethrough and an inner wall centrally located in said passage and closing said passage, whereby said tubular member closes said passage through said housing, said tubular member being connected with said slide valve means through a slot in said housing and movable within said housing passage to move said slide valve means between said first and said second positions, said first and said second valve means being positioned over and normally closing opposite ends of said housing passage and opening said respective end of said housing passage to atmosphere upon being actuated, and means for introducing air under pressure from said source thereof into said passage on opposite sides of said wall of said tubular member, whereby actuation of one or the other of said valve means by said spool vents to atmosphere compressed air in said passage on its respective side of said inner wall so that said tubular member is moved toward said actuated valve means by air under pressure on the opposite side of said wall to move said slide valve means to said first or said second position.

4,123,205

ROTARY VANE PUMP WITH SEALING MEANS

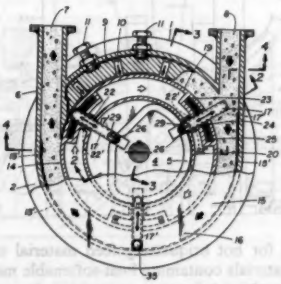
Gerhard Peleschka, Luetzelhausen, and Friederich Nuebling, Biebergemuend, both of Fed. Rep. of Germany, assignors to Wibau, Gruendau-Rothenbergen, Fed. Rep. of Germany

Filed Dec. 2, 1976, Ser. No. 746,734

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1976, 2601347

Int. Cl.[2] F01C *19/02, 19/08, 21/00, 1/00*

U.S. Cl. 418—127 **16 Claims**



1. In a pump having housing means with inlet port means and outlet port means as well as rotary piston means rotatably mounted in said housing means, said rotary piston means and said housing means defining a conveying channel between said inlet and outlet port means, said conveying channel having a suction end adjacent said inlet port means and a pressure end adjacent said outlet port means, radially displaceable slide means mounted on said rotary piston means for radial movement into and out of said conveying channel, guide means in said rotary piston means for guiding the radial movement of said slide means, and cam means in said housing means for radially moving said slide means in response to piston rotation, the improvement comprising first sealing means (**12, 13**) operatively arranged between said housing means and said rotary piston means substantially along the circumference of said rotary piston means adjacent to each side thereof, second sealing means (**24, 25**) operatively arranged to provide a seal between said radially displaceable slide means and said guide means, third sealing means (**29**) arranged to urge said slide means with the outer ends thereof radially against said housing means, fourth sealing means (**9, 10**) operatively arranged between said outlet port means and said inlet port means to block return flow from said outlet port means to said inlet port means and fifth sealing means (**34**) in the form of a sealing ring having a radially outwardly facing V-groove, one such sealing ring being inserted on each side of the rotary piston means between the latter and the respective housing means, said V-groove sealing rings extending laterally around said guide means and said cam means to further seal the guide means and the cam means against leakage penetration.

4,123,206

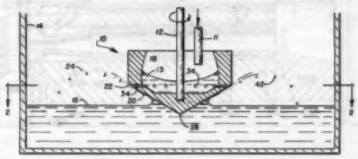
ENCAPSULATING APPARATUS

Clarence C. Dannelly, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,294

Int. Cl.[2] B29C *13/00*

U.S. Cl. 425—5 **6 Claims**



1. Apparatus for encapsulating material comprising

(a) a nozzle supported for rotation about a substantially vertical axis and adapted to be charged with material to be encapsulated, said nozzle having an outside circumferential surface inclined upwardly with increasing radius of said nozzle, and having at least one orifice through its wall terminating at said inclined circumferential surface through which material from said nozzle is extruded by centrifugal force when said nozzle is rotated,

(b) means for rotating said nozzle, and

(c) means for providing a body of liquid in position relative to said nozzle such that at rest, at least a portion of the inclined circumferential portion is submerged, whereby rotation of said nozzle causes a sheet of said liquid to be impelled radially outwardly and upwardly along said inclined circumferential surface and across the orifice to separate successive leading tips from the extruded material and form capsules of said material.

4,123,207

UNDERWATER PELLETIZER AND HEAT EXCHANGER DIE PLATE

Vernon E. Dudley, Scott Depot, W. Va., assignor to Gala Industries, Inc., Eagle Rock, Va.

Filed Mar. 29, 1976, Ser. No. 671,363

Int. Cl.[2] B29F *3/08*

U.S. Cl. 425—67 **9 Claims**

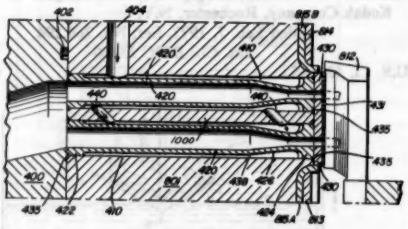
1. In an underwater pelletizer apparatus for extruding mol-

ten material into a water bath to solidify the material, the improvement comprising:

a solid die plate of substantial mass and having a plurality of spaced channels formed longitudinally therethrough, the channels extending completely through said die plate, solid portions of the die plate lying between the channels and defining walls of the channels, said solid portions being substantially continuous between adjacent channels, the die plate further having a plurality of passageways formed in said solid portions interconnecting the spaced channels;

a tubular member disposed within each of the spaced channels, the outer walls of each of the tubular members being spaced at least over central portions thereof from the walls of the channel in which said tubular member is disposed, each tubular member having a longitudinal opening formed therein, the opening communicating at a first end of the member with the water bath, the first end of each tubular member having a first enlarged portion which is contiguous about perimetric portions thereof to portions of the walls of said channel at the end of said channel adjacent said first end of said tubular member, each tubular member further having a second enlarged portion of the other end thereof contiguous to the walls of said channel at the end of said channel opposite said first end of said tubular member:

steam inlet means for directing a relatively heated fluent material into the portions of the spaced channels be-



tween the walls of said channels and the outer walls of the tubular members disposed therein, and through the passageways formed in the solid portions of the die plate to exchange heat with the tubular members and body portion of the die plate including said solid portions lying between the channels and defining the walls thereof;

steam outlet means for directing the heated fluent material from the spaced channels;

means for directing the molten material into and through the openings in the tubular members into the water bath; and,

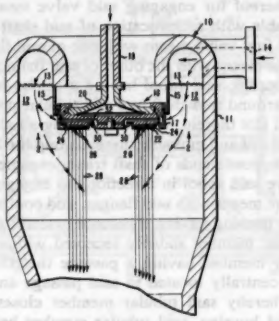
means for cutting the now-solidified molten material entering the water bath into substantially uniformly sized pellets, the molten material being maintained in a molten state throughout passage thereof through the tubular members due to heat exchange through walls of the tubular members including the first-mentioned enlarged portions thereof proximous to the water bath, the die plate including the solid portions lying between the channels and defining the walls thereof and the enlarged portions of the tubular members acting as means to retain heat for exchange with the molten material in heat sink fashion, and particularly to retain heat for transfer to the molten material at the first ends of the tubular members proximous to the water bath to present solidification of said molten material prior to entry thereof into the water bath.

4,123,208

DRY SPINNING PACK ASSEMBLY

Petrus Klaver, Waynesboro, Va., and Jacob G. Steenhof de Jong, Giessenburg, Netherlands, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 31, 1977, Ser. No. 783,454
Int. Cl.[2] B29F *3/08*
U.S. Cl. 425—72 S **3 Claims**



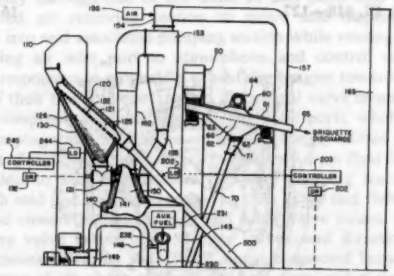
1. In an apparatus for spinning filaments that includes a spinning pack located in a chamber supplied with gas for impinging against and flowing through filaments extruded in a downward direction from the bottom surface of said spinning pack in concentric rings surrounding a central portion of said bottom surface, said spinning pack having a peripheral surface exposed to the gas in said chamber, the improvement comprising: a passage connecting said peripheral surface and said central portion of said bottom surface to provide a flow passage through said spinning pack for said gas, whereby a portion of the gas is aspirated from said chamber through said passage downwardly to the central portion of said bottom surface for impinging the innermost of said concentric rings as such filaments are being extruded.

4,123,209

BRIQUETTING PLANT

James E. Moore, 1401 Meadow La., Glenview, Ill. 60025

Filed Apr. 18, 1977, Ser. No. 788,639
The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.
Int. Cl.[2] B29B *3/00, 1/00*
U.S. Cl. 425—74 **37 Claims**



1. A plant for hot briquetting feed material consisting of particulate materials containing heat-softenable matter and for cooling the resulting briquettes comprising, in combination, a low temperature feed/briquette heat exchanger in the form of a tumbler having an input and an output, a low temperature screen at the output, an intermediate temperature feed/-briquette heat exchanger in the form of a tumbler having an input and an output and an intermediate temperature screen at

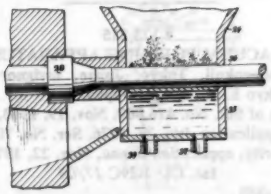
the output, a furnace in the form of a fluid bed reactor having an input and an output, a roll type compactor at the output of the furnace, means for feeding the feed material to the plant in succession through the low and intermediate temperature heat exchangers and thence into the furnace, means for feeding hot briquettes from the compactor in succession through the intermediate and low temperature heat exchangers for progressive heating of the feed material and for discharge of the briquettes from the low temperature screen in substantially cooled condition.

4,123,210

BRIQUETTE FORMING APPARATUS

Albert C. Schulz, Hudson, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 3, 1977, Ser. No. 839,063
Int. Cl.² B30B *11/02*
U.S. Cl. 425—78 **6 Claims**



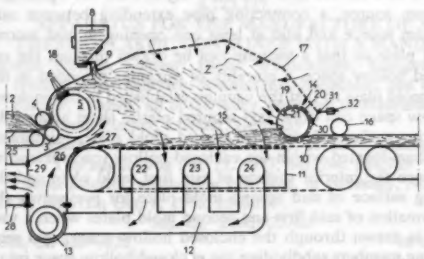
1. Briquette forming apparatus for compressing uniformly dense briquettes from a quantity of hot metallic chips, said apparatus including a chip-box assembly with horizontally aligned apertures adapted to receive said chips, an annular forming die carried by said chip-box in alignment with the horizontally aligned apertures, an anvil with a convex head horizontally aligned with the annular die, means supporting the convex anvil independent from the chip-box assembly, means for moving the chip-box and die assembly horizontally against said convex anvil, and a ram movable through the chip-box and annular die adapted to compress a quantity of metallic chips in said die against the convex anvil.

4,123,211

APPARATUS FOR MAKING A BONDED FELT WEB

Bernard Rudloff, 30, avenue Charles de Gaulle, Ribeauville (Haut-Rhin), France

Filed Jun. 28, 1976, Ser. No. 700,348
Claims priority, application France, Jun. 30, 1975, 75 21619
Int. Cl.² B29C *13/00*; D04H *1/60*
U.S. Cl. 425—82.1 **5 Claims**



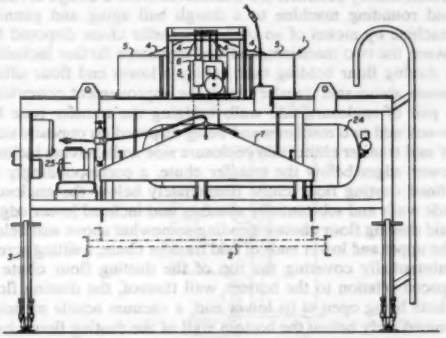
1. An apparatus for making non-woven webs comprising a feeding conveyor, a pair of fluted rollers to which fibres are fed by said feeding conveyor, a device for separating said fibres supplied thereto from between said fluted rollers, a mixing chamber receiving the separated fibres from said device, a sprinkling device for sprinkling powdered bonding resins into said mixing chamber through a channel, a perforated collecting conveyor forming the lower part of said mixing chamber, a suction chest disposed below an operative portion of said collecting conveyor, a duct leading from said suction chest, a suction fan drawing air through said duct from said suction chest, a levelling device for equalising the thickness of the wadding layer formed by said fibres deposited upon said collecting conveyor, and a flattening roller acting upon the wadding layer leaving said levelling device, the apparatus being characterised in that the device for separating the fibres is constituted by a carding drum provided with points.

4,123,212

APPARATUS FOR UNIFORMLY DISTRIBUTING GLASS FIBERS

Matthew R. Piazza, Nichols, Conn., assignor to Maso-Therm Corporation, Bridgeport, Conn.

Filed Jun. 27, 1977, Ser. No. 810,451
Int. Cl.² B29D *7/08*
U.S. Cl. 425—82.1 **5 Claims**

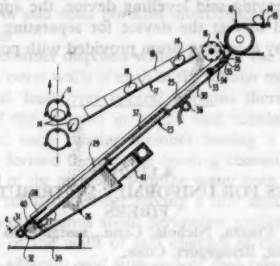


1. An apparatus for incorporating a substantially uniform distribution of glass fibers onto a forming bed of wet cementitious material, the apparatus comprising: a bed of wet cementitious material; means receptive of a multiplicity of continuous strands of glass fibers for chopping same into desired lengths; hood means downstream of the chopping means and receptive of glass fibers dropped therein for dispersing same to form a random uniform matrix and uniformly distributing same along a desired width of the bed, comprising means defining a first chamber for receiving chopped glass fibers dropped into the hood means, means defining a second chamber in communication with said first chamber and downstream thereof for dispersing the glass fibers received from the first chamber to effect the random uniform matrix thereof along the width of the bed and including means for creating a turbulence therein, and means defining a third chamber having an adjustable length elongated outlet aperture extending across a desired width of the bed and disposed downstream of the second chamber and receptive of the dispersed glass fibers in the random uniform matrix to substantially isolate the fibers therein from the turbulence in the second chamber; means mounting the hood and chopping means above the bed for movement relative thereto along the length of the bed for substantially uniformly distributing the glass fibers therein on the desired width of the bed by dropping same through the aperture during relative movement along the length of the bed; and means for distributing the uniform distribution of fibers in a random uniform matrix within the cementitious material.

4,123,213
AUTOMATIC BAKERY PRODUCT DUSTING FLOUR RECYCLING SYSTEM

William D. Laramore, Rte. 1, Summerhill Rd., Thomasville, Ga. 31792

Filed May 31, 1977, Ser. No. 802,056
Int. Cl.[2] A21C 9/04
U.S. Cl. 425—104 7 Claims

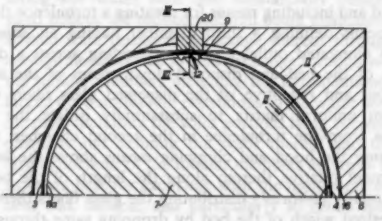


1. In bakery product manufacturing apparatus of the type in which bakery products are transferred from a dough dividing and rounding machine to a dough ball aging and panning machine by means of an inclined transfer chute disposed between the two machines, and said apparatus further including a dusting flour holding tank having a lower end flour sifting means above said transfer chute, the improvement comprising a pair of enclosure side walls bridging the transfer zone between said two machines and being disposed on opposite sides of said transfer chute, said enclosure side walls having inclined lower edges below the transfer chute, a correspondingly inclined dusting flour chute immediately below the enclosure side walls and substantially abutting said inclined lower edges, said dusting flour chute extending somewhat above and below the upper and lower ends of said transfer chute, a sifting screen substantially covering the top of the dusting flour chute in spaced relation to the bottom wall thereof, the dusting flour chute being open at its lower end, a vacuum nozzle mounted immediately below the bottom wall of the dusting flour chute and having a lower end intake disposed in direct communication with the lower open end of the dusting flour chute, and excess dusting flour recycling means interconnecting said vacuum nozzle with said dusting flour holding tank.

4,123,214
CONTAINERS

Brian L. C. Sutch, Thames Ditton, England, assignor to Airfix Industries Limited, London, England

Continuation of Ser. No. 581,670, May 28, 1975, abandoned.
This application May 26, 1977, Ser. No. 801,005
Claims priority, application United Kingdom, May 28, 1974, 23663/74
Int. Cl.[2] B29F 1/10
U.S. Cl. 425—129 R 3 Claims

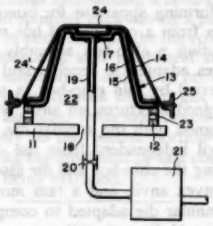


1. Apparatus for making a composite container of sheet material and injection moulded plastic comprising a core tool and a cavity tool which together define a blank cavity to receive blank sheet material in the shape of the container to be produced, one of the tools including a seam cavity to form a seal between juxtaposed edges of the blank material on one face of the blank material and a feed cavity communicating with the seam cavity, and the other tool including a bead mould channel, to which the face of the sheet material remote from the seam will be exposed, overlying the feed channel and in the absence of the blank sheet material the bead mould channel communicates with the feed channel and with the seam cavity, gate means in said cavity tool for injecting plastic material into said seam cavity and thence into said feed cavity to force the overlying portion of the sheet material into said bead mould cavity, and means reducing the depth of the bead mould channel, at least during the initial stages of injecting material, in the area where said channel overlies the seam cavity so as to prevent injected material in that area from spreading apart the juxtaposed edges of a blank of sheet material and flowing to the exterior of the blank material at those edges.

4,123,215
VACUUM FORMING APPARATUS

Tadahide Madenokoji, Tokyo, Japan, assignor to Kodama Kagaku Kohyo K. K., Tokyo, Japan

Continuation of Ser. No. 416,800, Nov. 19, 1973, abandoned.
This application Jun. 28, 1976, Ser. No. 700,186
Claims priority, application Japan, Nov. 22, 1972, 47-117307
Int. Cl.[2] B29C 17/04
U.S. Cl. 425—388 17 Claims



1. A vacuum forming mold for use in a vacuum forming operation in which a heated and softened plastic sheet secured in place is shaped which comprises a first shaped mold plate including an exterior surface against which said secured plastic sheet is disposed and an oppositely directed interior surface, a second mold plate disposed in juxtaposed spaced relation to at least a shaped portion of said interior surface of said first shaped mold plate forming an enclosed hollow space therebetween, said second mold plate having at least one opening, a vacuum source, a connecting pipe extending between said vacuum source and said at least one opening in said second mold plate so that a vacuum can be drawn through the enclosed hollow space, a plurality of openings provided in the first mold plate so that the vacuum established in the enclosed hollow space can draw said secured plastic sheet against the exterior surface of said first shaped mold plate, reinforcing members located within the enclosed hollow space extending between the interior surface of said first mold plate and the facing surface of said second mold plate for preventing the deformation of said first and second mold plates when a vacuum is drawn through the enclosed hollow space, said reinforcing members subdividing the enclosed hollow space into a plurality of subspaces and said reinforcing members having openings therethrough intercommunicating the subspaces, and means for moving said exterior surface of said first mold plate against said secured plastic sheet wherein said means for moving said exterior surface of said first mold plate includes a bed member, with an opening provided therein, so as to form an

inner space disposed between said bed member and said second mold plate, such that said inner space is communicated to atmosphere through said opening provided in said bed member and wherein said connecting pipe extends through said opening and is partially disposed within said inner space.

4,123,216

COAL COMPACTING APPARATUS

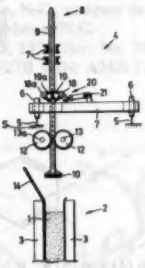
Kurt Leibrock, Fürstenhausen, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrucken, Fed. Rep. of Germany

Filed Jan. 25, 1977, Ser. No. 762,420

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603677

Int. Cl.[2] B28B *1/04*

U.S. Cl. 425—431 **11 Claims**



1. In an apparatus for compacting coal into a cake for use in coke ovens, a combination comprising a pounding box for receiving coal to be compacted; a plurality of punners each having a foot and a rod formed with a web and projecting upwardly from the foot; means mounting said punners above said pounding box for repeated lifting relative to the pounding box and dropping onto the coal in the same; a mechanism for retaining the punners in raised position upon completion of the compacting operation, said mechanism comprising a pair of pivoted locking cams mounted at opposite sides of each of said punner rods, and each cam of a respective pair being mounted for swinging movement about a pivot and having an arcuate gripping contact surface which subtends an angle smaller than 90° at the associated pivot, and said cams being mounted on respective shafts with freedom of limited angular lost motion relative thereto; and means operatively connected with said cams for mechanically swinging the cams of each pair into gripping engagement with the opposite sides of said web of the associated rod for retaining the same in the raised position thereof.

4,123,217

APPARATUS FOR THE MANUFACTURE OF A THERMOPLASTIC CONTAINER WITH A HANDLE

Stefan Fischer, Lohmar; Dieter Wollschläger, Königswinter; Helmut Scharrenbroich, Neunkirchen-Seelscheid, and Rainer Fischer, Lohmar, all of Germany, assignors to Maschinenfabrik Johann Fischer, Lohmar, Germany

Continuation of Ser. No. 635,066, Nov. 25, 1975, abandoned. This application Jul. 11, 1977, Ser. No. 814,759

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1974, 2456723; Oct. 8, 1975, 2545014

Int. Cl.[2] B29D *23/03*

U.S. Cl. 425—525 **16 Claims**

1. A blow molding apparatus for forming containers with handles from thermoplastic material, comprising in combination:

(a) two complementary mold halves, each defining a cavity which together define the container outline when the mold halves are engaged, and each including a channel which extends through the wall of the mold half and terminates in the cavity, said channels being in alignment when the mold halves are engaged;

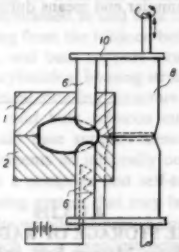
(b) a parison forming means for producing and inserting a parison between the mold halves, said parison forming means being located in proximity to the mold halves so that the parison is held in the cavities by the mold halves when the mold halves are engaged;

(c) means for supporting said mold halves such that the mold halves are engaged when the parison has been inserted by said parison forming means between said mold halves;

(d) blow molding means for inflating the thermoplastic material in the closed mold halves;

(e) a pair of complementary platforms, each having mounted thereon in spaced relationship a punch and a plunger and each located in proximity to a respective one of the mold halves for insertion of said punch and said plunger into the channel of the respective mold half, each punch and plunger defining an indexing position of its respective platform, with both punches and both plungers having a substantially similarly configured free end for engaging the thermoplastic material, and with both punches and both plungers being dimensioned for reception within the channel of its associated mold half; and

(f) drive means for each platform, said drive means engaging their respective platforms for rotation between their indexing positions and reciprocation toward and away from their associated mold halves at each of their indexing positions, wherein:



(i) the indexing positions of each platform are further defined by the respective alignment of the punches and plungers with their associated mold half channels;

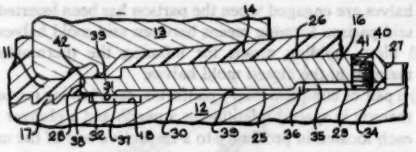
(ii) the plungers extend through the aligned channels of their associated mold half and engage the thermoplastic material in the cavity of their associated mold half when the mold halves are engaged and as a result of the platforms being moved by their drive means toward their associated mold half, to thereby form aligned bulges in the thermoplastic material during the process of blow molding the material in the cavities; and

(iii) the punches extend through the aligned channels of their associated mold half and engage the thermoplastic material in the cavity of their associated mold half at the aligned bulges when the mold halves are engaged and as a result of the platforms being moved by their drive means toward their associated mold half, to thereby squeeze together the thermoplastic material in the region of the bulges, and consequently joining the thermoplastic material forming the bulges, to form spaced adjacent continuous surfaces of the container and handle.

4,123,218
BLOW PIN ASSEMBLY WITH VENTING MEANS

Thomas J. Krall, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 8, 1977, Ser. No. 813,854
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—535 5 Claims

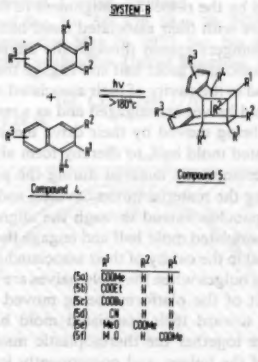


1. A blow pin assembly for forming a bunghole in a plastic parison and for supplying blow air to expand such parison into a hollow container, comprising a generally cylindrical pin body having an axial blow air passage means extending therethrough and having a projecting end means for inserting into an end of such parison, thread means formed in said projecting end means for molding bunghole threads in such parison end, a tubular sleeve mounted coaxially on said pin body, said sleeve having an annular end means adjacent said thread means and facing said projecting end means for molding a flat annular sealing surface in such parison end adjacent such bunghole threads, and means between said sleeve and said pin body for venting trapped air from between such parison, said thread means and said annular end means during molding.

4,123,219
CHEMICAL STORAGE OF RADIANT ENERGY

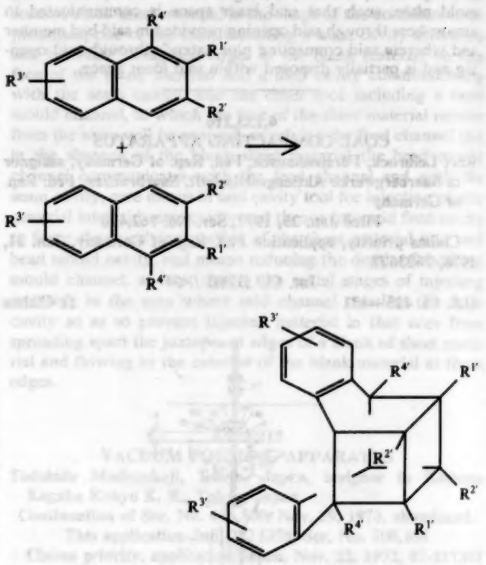
Wolfgang H. F. Sasse, Malvern East, and Tsutomu Teitei, Mulgrave, both of Australia, assignors to Commonwealth Scientific and Industrial Research, Cambell, Australia

Division of Ser. No. 512,978, Oct. 7, 1974, Pat. No. 3,994,675.
This application Sep. 17, 1976, Ser. No. 724,118
Claims priority, application Australia, Oct. 8, 1973, 5132/73
Int. Cl.[2] F24J *3/02*
U.S. Cl. 432—1 10 Claims



	R[3']	R[2']	R[4']
(5a)	COOMe	H	H
(5b)	COOEt	H	H
(5c)	COOBu	H	H
(5d)	CN	H	H
(5e)	MeO	COOMe	H
(5f)	M.O.	H	COOMe

1. A method for generating heat which comprises exposing compounds of formula (4) to radiant energy to form a compound of formula (5)

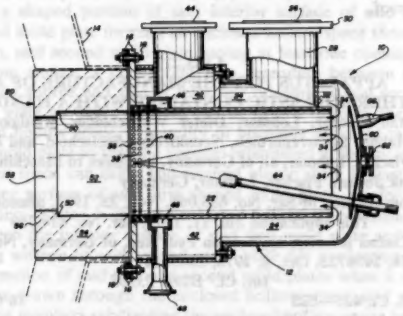


wherein in formula (4) and (5) $R^{3'}$ is hydrogen, an alkoxy group (up to C3) or an ester (COOR, where R is methyl, ethyl, or propyl); each of $R^{1'}$, $R^{2'}$ and $R^{4'}$ is hydrogen, alkoxy (up to C3), ester (COOR where R is methyl, ethyl or propyl), nitrile, alkyl (up to C4), fluoro or chloro provided that one or two of the groups $R^{1'}$ to $R^{4'}$ is hydrogen; or anhydrides of the naphthoic acids corresponding to the compound (4); heating compound (5) to release the energy as heat and reform the compounds (4).

4,123,220
GAS MIXER AND REACTOR

Desmond H. Bond; George W. Taggart, both of Dallas, and Kurt S. Jaeger, Hurst, all of Tex., assignors to Ford, Bacon & Davis Texas, Inc., Garland, Tex.

Division of Ser. No. 508,674, Sep. 23, 1974, Pat. No. 4,003,856.
This application Mar. 31, 1976, Ser. No. 672,410
Int. Cl.[2] F23D *15/02*
U.S. Cl. 431—353 24 Claims



1. A gas mixer and reactor comprising:
(a) an elongated gas flow chamber having a first end which carries an inlet thereto and a second end which carries an outlet therefor;
(b) a thermal reaction chamber communicating with said

outlet at said second end of said elongated gas flow chamber;

(c) injection means for injecting gas annularly into said elongated gas flow chamber through said inlet thereof towards said outlet thereof from points uniformly about the inner periphery of said elongated gas flow chamber;

(d) gas nozzle means positioned adjacent said second end and around said elongated gas flow chamber, and directed into said elongated gas flow chamber and toward said thermal reaction chamber; and

(e) an inset annular step in said thermal reaction chamber spaced from said outlet of said elongated gas flow chamber.

4,123,221

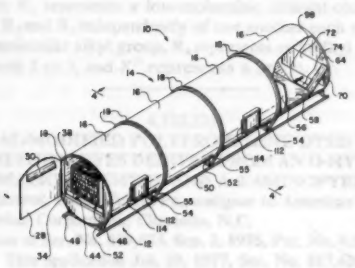
BULK TOBACCO CURING AND DRYING STRUCTURE

Tiras J. Danford, Lewiston, N.C., assignor to Harrington Manufacturing Company, Lewiston, N.C.

Filed Dec. 27, 1976, Ser. No. 754,586

Int. Cl.[2] F27B *9/04*; A24B *1/02*

U.S. Cl. 432—152 **15 Claims**



1. A bulk tobacco curing and drying structure comprising: a main cylindrical housing structure of an integrated top, side and bottom imperforated cylindrical wall design; said main cylindrical housing structure forming a structurally enclosed drying chamber that is relatively air tight and which includes at least one loading door for allowing bulk tobacco to be placed therein; said main cylindrical housing structure including a plurality of cylindrical sections with each cylindrical section having two ends, and wherein respective ends of said cylindrical sections are joined together such that the cylindrical sections are secured together end to end in axial alignment to form an elongated cylindrical housing structure; bulk tobacco container support means disposed interiorly of said drying chamber and supported by said main cylindrical housing for supporting a plurality of bulk tobacco container means within said curing and drying structure; bulk tobacco containing means for supporting bulk tobacco in said drying chamber and wherein said bulk tobacco containing means is adapted to be supported interiorly of said drying chamber on said bulk tobacco container support means; said cylindrical housing forming a lower plenum enclosure in an area below the lower level of tobacco contained and supported in said bulk tobacco containing means when supported within said drying chamber, said defined lower plenum area being integrally housed by said main cylindrical housing and forming a part thereof; a forced air furnace system operatively associated with said main cylindrical housing for forcing air into said drying chamber and through the bulk tobacco supported in said bulk tobacco containing means for curing and drying the tobacco disposed within the drying chamber, said furnace system heating the forced air as necessary to maintain a desired temperature within the curing and drying chamber of said curing and drying structure; said main cylindrical housing structure, said bulk tobacco container support means, and said bulk tobacco container means being designed so as to cooperate to confine and force vertically moving air from said furnace system to pass through the tobacco contained in said bulk tobacco container means without escaping from the tobacco before passing completely therethrough; and base support structure means engaged with said main cylindrical housing structure for supporting said main cylindrical housing structure above a site of installation, whereby said bulk tobacco curing and drying structure including said base support means and said main cylindrical housing presents an integrally constructed closed drying system that in a complete and self-sufficient bulk tobacco curing and drying system that may be directly placed about an installation site without requiring significant preinstallation preparation such as a preconstructed foundation or concrete slab structure.

4,123,222

PROCESS FOR THE DYEING OR PRINTING OF POLYACRYLONITRILE MATERIAL

Peter Loew, Munchenstein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

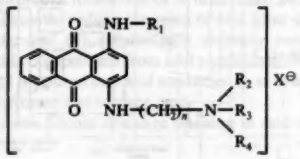
Filed Mar. 16, 1977, Ser. No. 778,655

Claims priority, application Switzerland, Mar. 23, 1976, 3606/76; Nov. 11, 1976, 14215/76

Int. Cl.[2] C09B *1/00*; C07C *97/12*

U.S. Cl. 8—39 A 5 Claims

1. Process for the dyeing or printing of polyacrylonitrile materials, which process comprises the use of dyes of the formula (1)



(1)

wherein R_1 represents a low-molecular, straight-chain alkyl group, R_2 and R_3 independently of one another each represent a low-molecular alkyl group, R_4 represents an aralkyl group, *n* represents 2 or 3, and $X^{\ominus}$ represents a anion.

4,123,223

METAL-MODIFIED POLYPROPYLENE DYED WITH AZOMETHINE DYES DERIVED FROM AN O-HYDROXY AROMATIC ALDEHYDE AND A 2-AMINOPYRIDINE

Raouf Botros, Beech Creek, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

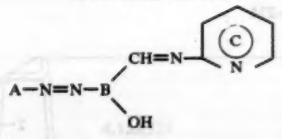
Division of Ser. No. 609,683, Sep. 2, 1975, Pat. No. 4,051,119. This application Jul. 20, 1977, Ser. No. 817,431

The portion of the term of this patent subsequent to Mar. 15, 1994, has been disclaimed.

Int. Cl.[2] C09B *29/12, 29/36*; D06P *1/18, 3/79*

U.S. Cl. 8—42 D 6 Claims

1. A dyed polypropylene textile material, the polypropylene being modified with a metal selected from the group consisting of nickel, aluminum and zinc, and the dye being an azomethine dye of the formula:



wherein

A is phenyl, naphthyl, phenyl substituted by up to 3 substituents or naphthyl substituted by up to 2 substituents, said substituents being independently selected from lower alkyl of 1–4 carbons; lower alkoxy of 1–4 carbons; nitro; cyano; fluorine; chlorine; bromine; trifluoromethyl; hydroxyl; RCOO—, where R is alkyl of 1–4 carbons; carboxyl; ROOC—, where R is alkyl of 1–4 carbons; RCO-, where R is alkyl of 1–4 carbons; benzoyl; RCONH-, where R is alkyl of 1–4 carbons; ArCONH-, where Ar is phenyl; or carbamyl, the nitrogen of which is unsubstituted or singly or doubly substituted by alkyl of 1–4 carbons;

B is salicylaldehyde, o-hydroxy -naphthaldehyde, or salicylaldehyde or o-hydroxy-naphthaldehyde substituted by up to 2 substituents independently selected from lower alkyl of 1–4 carbons; lower alkoxy of 1–4 carbons; cyano; fluorine; chlorine or bromine; and

C is 2-aminopyridyl or 2-aminopyridyl substituted by up to 2 substituents independently selected from lower alkyl of 1–4 carbons; lower alkoxy of 1–4 carbons; nitro; chlorine or bromine.

4,123,224

DIAGNOSTIC TEST DEVICE

Morris L. Givner, Pierefonds, and Guenther Schilling, Westmount, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 645,860, Dec. 31, 1975, Pat. No. 4,033,723. This application Jun. 21, 1977, Ser. No. 808,587

Claims priority, application Canada, Dec. 17, 1975, 242214

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.[2] B01D *31/00*; G01N *21/04, 33/16*

U.S. Cl. 422—59 22 Claims

1. A diagnostic test device suitable for the detection of human gonadotrophins, luteinizing hormone, or follicle-stimulating hormone in serum or urine, which comprises:

(a) chamber means including an ultrafiltration membrane for concentration of the urine or serum and means for collecting the concentrate;

(b) means for transferring the collected concentrate to a detection receptacle means;

(c) detection receptacle means for the detection of human gonadotrophins, luteinizing hormone, or follicle-stimulating hormone in the concentrate by immunological means; and

(d) wherein said chamber means including an ultrafiltration membrane has been prewashed with a solution of protein.

4,123,225

COMBUSTIBLE GAS DETECTORS

Eric Jones, Chelmsford, and Rodney P. Townsend, Harlington, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Jul. 5, 1977, Ser. No. 812,695

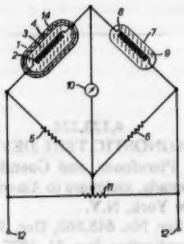
Claims priority, application United Kingdom, Jul. 6, 1976, 27961/76

Int. Cl.[2] B01J *23/40, 23/58*; G01N *27/16, 31/12*

U.S. Cl. 422—98 17 Claims

1. A gas detector comprising a heatable wire filament em-

bedded in a pellet and provided with an outer layer of non-catalytic porous material tending to prevent non-volatile resi-



dues from reaching catalytically active regions of said detector.

4,123,226

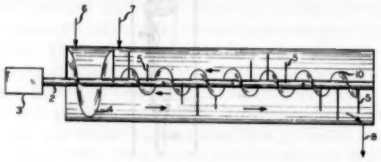
METHOD EMPLOYING A MIXING DEVICE WITH INTERNAL RECYCLE

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 26, 1977, Ser. No. 762,690

Int. Cl.[2] B01F *7/04, 7/08;* C09C *1/58*

U.S. Cl. 23—314 **2 Claims**



1. In a method of mixing in an elongated horizontally disposed mixing zone comprising an agitating section, the steps which comprise continuously feeding to a locus in one end of said zone, materials to be mixed therein, maintaining in said zone a mass of materials to be mixed therein, passing the mass thus formed through said zone to a withdrawal locus at the other end of said zone and there withdrawing at least partly-mixed material from said zone, the improvement which comprises continuously impelling rearwardly at least a portion of said mass substantially only in the surface of said mass which is in the axial section of said zone as said mass moves from one locus of said zone to the other towards said withdrawal locus, thus moving said portion of said mass in said surface in said axial section of the said zone in counter-current flow with the overall movement of the mass through said zone.

4,123,227

METHOD AND APPARATUS FOR EVALUATING CHANGES IN INDICATOR TUBES

Ulrich Heim, Reinfeld; Kurt Leichnitz, Gross Grönau, and Peter Wiesner, Ratekau, all of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Germany

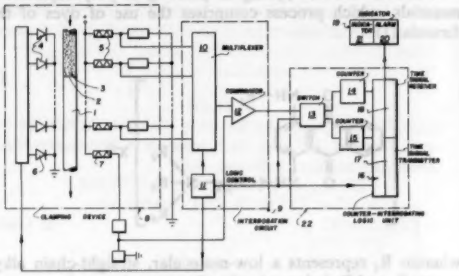
Filed Jun. 24, 1977, Ser. No. 809,674

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1976, 2628790

Int. Cl.[2] G01N *21/26, 21/28, 31/06*

U.S. Cl. 23—232 R **10 Claims**

1. A method of gas measuring and warning using light barriers one of which is a reference light barrier located at spaced locations along the length of an indicator tube which has a substance therein which varies in light intensity and/or color to provide a gas value in accordance with a gas of a preselected type which is passed therethrough and wherein the light barriers are formed by a light source for directing light across the indicator tube and a light detector for sensing the light, comprising directing a gas to be measured through the indicator tube, directing light from the light source of the barriers through the indicator tube and sensing the intensity of the light which is passed through the indicator tube with the light detectors at the locations of the barriers, converting the light intensity sensed at the barriers into a logic signal by continuously comparing the light intensity sensed at the reference light



barrier with that sensed at the remaining light barriers, alternately storing the sensed logic signals into two separate counters, periodically determining the difference of the values in said two counters and using the determined difference to start a time signal transmitter and a time signal receiver, and whenever a new difference of the counters results from subsequent determinations of the difference in the counters which new difference produces a new signal, using the new signal to start an alarm.

4,123,228

FILTERS FOR LIQUIDS

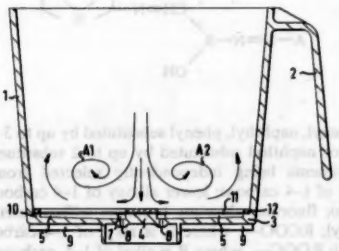
Roland Frei, Widnau; Franz Gutmann, Rebstein; Peter Sieber, and Peter Koeppel, both of Widnau, all of Switzerland, assignors to Plaston AG, Kunststoffwerke Hans Frei & Sohne, Widnau, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,694

Claims priority, application Switzerland, Mar. 21, 1977, 3537/77

Int. Cl.[2] B01D *59/22*

U.S. Cl. 422—274 **7 Claims**



1. Apparatus for leaching soluble components from particulate solids by means of a liquid, said apparatus comprising:

a container for said solids;

a base constituting part of said container and having a generally horizontal generally planar inner face;

a plurality of radial ribs on said inner face extending axially into said container and having upper surfaces lying in a plane approximately parallel to and closely spaced from the plane of said inner face, adjacent pairs of ribs defining passageways for radial flow of liquid;

a support member positioned centrally on said inner face and

extending axially into said container and having a flat upper surface lying in the plane of said upper surfaces of said ribs;

a generally planar filter element of thin sheet material supported within said container on said upper surfaces of said ribs and on said upper surface of said support member in spaced parallel relationship to said base; means defining an imperforate, flat surface disposed above said support member and said filter element, said support member, ribs, filter element and said imperforate flat surface cooperatively functioning to provide a toroidal circulation sufficient to (a) significantly reduce compacting of said solids (b) promote formation of a filter cake of said solids (c) significantly reduce clogging of said filter element by said solids, and (d) substantially promote recovery of said soluble components from said particulate solids, when said liquid is poured into said container so as to impinge on said imperforate flat surface, and

at least one filtrate drainage opening in said base.

4,123,229

METHOD AND APPARATUS FOR MAKING VITREOUS SILICA

Justice N. Carman, Tarzana, Calif., assignor to John S. Pennish, Los Angeles, Calif., a part interest

Division of Ser. No. 684,108, May 7, 1976, Pat. No. 4,054,641. This application Jun. 6, 1977, Ser. No. 803,649

Int. Cl.[2] B01J *10/00;* **C01B** *33/12*

U.S. Cl. 422—199 **11 Claims**

1. In an apparatus for making vitreous silica, the combination of:

a first chamber for liquid silicon;

means for heating said first chamber;

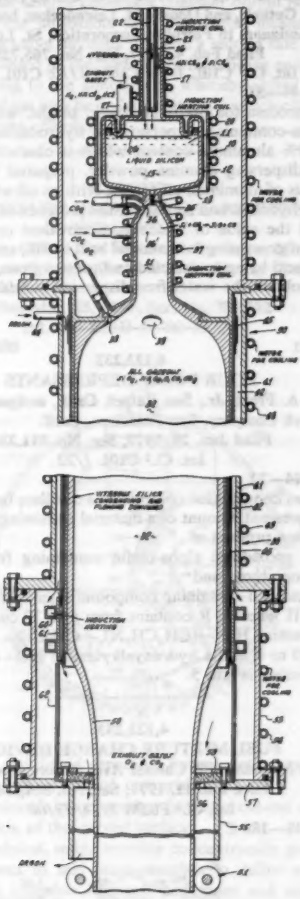
a second elongate chamber disposed in a generally vertical position;

means for directing a stream of liquid from said first chamber into an upper section of said second chamber;

means for heating said upper section of said second chamber;

means for directing a stream of carbon dioxide into said upper section for mixing with said stream of liquid;

means for directing a stream of oxygen into a lower section of said second chamber below said upper section for mixing with the material moving down from said upper section; and



means for cooling the wall of said second chamber at said lower section for condensing silicon dioxide on the inner surface thereof.

4,123,230

SULFUR REMOVAL FROM COAL

Chalmer G. Kirkbride, 13 Elk Forest, R.D. #2, Elkton, Md. 21921

Filed Sep. 7, 1977, Ser. No. 831,170

Int. Cl.[2] C10L *9/10;* **C10B** *57/00;* **C10C** *1/08*

U.S. Cl. 44—1 R **11 Claims**

1. Process for reducing the sulfur content of coal which comprises subjecting a mixture of dry coal and hydrogen to microwave energy at a temperature of about 40° F. to about 300° F. for a time of not more than 10 minutes, and recovering coal having a reduced sulfur content as the product of the process.

4,123,231
CLEAR, BRIGHT OIL-SOLUBLE ALUMINUM-CONTAINING COMPOSITIONS

David B. Guthrie, and Donald M. Leiendecker, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Feb. 4, 1977, Ser. No. 765,725
Int. Cl.[2] C10L 1/10; C10M 1/10; C10L 1/12
U.S. Cl. 44—51 11 Claims

1. A process for preparing clear, bright, water-free, high aluminum-containing dispersions in hydrocarbons at at least about 20% aluminum content which is characterized by the step of dispersing alumina powder, prepared by the water hydrolysis of aluminum alkoxides, with an oil soluble sulfonic acid in a hydrocarbon solvent in the presence of aqueous mineral acid the anion of which is monovalent or salts thereof capable of generating said mineral acid in situ, said monovalent mineral acid being so selected and present in an amount sufficient to obtain the water-free dispersion substantially free of residues.

4,123,232
POUR POINT DEPRESSANTS

Kenneth A. Frost, Jr., San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 29, 1977, Ser. No. 811,236
Int. Cl.[2] C10L 1/22
U.S. Cl. 44—72 8 Claims

1. A fuel composition comprising a distillate fuel and a pour-point depressant amount of a material consisting essentially of the reaction product of

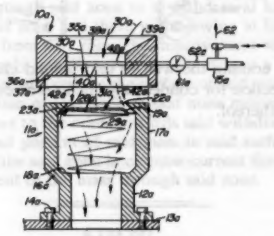
(1) an epoxidized alpha-olefin containing from 14 to 30 carbon atoms, and

(2) a nitrogen-containing compound selected from an amine R_2NH wherein R contains from 6 to 30 carbon atoms, a polyamine $H_2N—(CH_2CH_2N)_x—CH_2CH_2—NH_2$ wherein x is 0 to 4, and a hydroxyalkylamine $HO—(CH_2)_y—NH_2$ wherein y is 1 to 5.

4,123,233
FUEL MIXTURE CHARGE DEVICE

Albert A. Mannino, 300 Chester Ave., Moorestown, N.J. 08057

Filed Jul. 11, 1977, Ser. No. 814,698
Int. Cl.[2] F02M 7/24, 13/08
U.S. Cl. 48—180 C 4 Claims



1. A fuel mixture charge device for association with the combustion chamber inlet of an internal combustion engine, said device comprising a longitudinally extending air inlet conduit having inlet and outlet ends, outlet end connection means on said conduit for connection to the combustion chamber inlet in fluid communication therewith, the inlet end of said conduit being connected with the ambient air for conducting air through said conduit to the combustion chamber, a one-way valve in said inlet end of said conduit for passing ambient air into said conduit, resilient means associated with said one-way inlet valve urging the latter closed to permit opening upon reduced pressure in said conduit, for passing air according to engine requirements and a fuel feeding needle valve associated with said conduit for feeding fuel to said conduit and comprising a hollow needle valve body having an inlet connected to a fuel supply pipe and an internally tapering outlet, and elongate needle valve element spaced within the interior of said valve body and longitudinally shiftable therein, an externally tapering end on and movable with said valve element within said internally tapering outlet toward and away from conforming closing engagement therein, a needle valve spring urging said needle valve element toward said closing engagement, and variable manual operating means connected to said needle valve element for selective positioning thereof, and a funnel on the air inlet end of said conduit for directing air into the latter, said fuel feeding needle valve being connected to said funnel for dispensing fuel into the air entering said conduit, said one-way valve comprising a seat in said conduit adjacent to and facing inwardly from its inlet end, and a valve element movable into and out of closing engagement with said seat, and said resilient means comprising bearing means in said conduit inwardly of and facing toward said seat, and resilient compression means interposed between said bearing means and valve element to yieldably urge the latter toward said closing engagement, said bearing means comprising a circumferential internal shoulder in said conduit facing toward said valve element, and said resilient compression means comprising a coil compression spring interposed between said shoulder and valve element, said spring being seated on said shoulder for passage of the air and fuel mixture radially through said spring.

4,123,234
ALKANOL AMINE PHOSPHATE FOR IMPROVING ELECTROSTATIC PRECIPITATION OF DUST PARTICLES

Peter H. Vossos, Lisle, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 12, 1977, Ser. No. 859,419
Int. Cl.[2] B03C 3/00
U.S. Cl. 55—5 2 Claims

1. In a method of improving the conductivity of particles entrained in a stream of particle-laden gas formed by the burning of coal, which particles are collected by an electrostatic precipitator the improvement of which comprises treating said gas containing particles prior to contact with the electrostatic precipitator at a temperature not greater than about 650° F. with a sufficient amount of resistivity-decreasing an alkanol amine phosphate.

4,123,235
SEPARATION OF CARBON BLACK BY THE USE OF AN OXYGEN CONTAINING HIGHER BOILING PRODUCT

Heinz Giesen; Josef Hibbel; Willi Jansen, and Sebastian Speth, all of Oberhausen, Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 602,238, Aug. 6, 1975, abandoned. This application Jul. 29, 1977, Ser. No. 820,341
Claims priority, application Fed. Rep. of Germany, Aug. 23, 1974, 2440473
Int. Cl.[2] B01D 11/02
U.S. Cl. 55—85 9 Claims

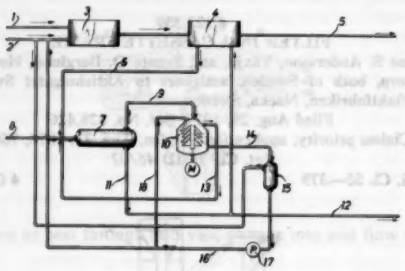
1. A process for separating carbon black from a liquid containing it comprising

(a) adding 20 to 100 parts of at least one oxygen containing higher boiling product which is the non-volatile residue produced as a by-product of the oxo-synthesis per part of carbon black to said liquid to form a first mixture and whereby said carbon black passes into the oxygen containing product phase to form an admixture

(b) passing said first mixture into a settling zone,

(c) separating said admixture from said liquid by the method comprising

(l) permitting said admixture to form a layer upon the surface of said liquid, and



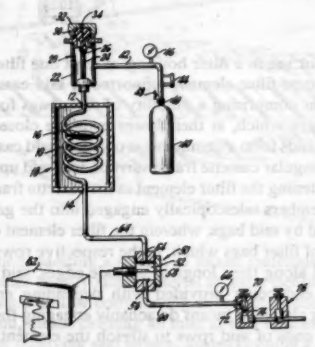
(d) passing said layer through a disk centrifuge having a plurality of conical disks.

4,123,236

GAS CHROMATOGRAPH DEVICE

T. Hirschfeld, Framingham, and David C.A.G. Brown, Cambridge, both of Mass., assignors to Block Engineering Inc., Cambridge, Mass.

Filed Feb. 28, 1975, Ser. No. 553,989
Int. Cl.[2] B01D *15/08*
U.S. Cl. 55—197 **4 Claims**



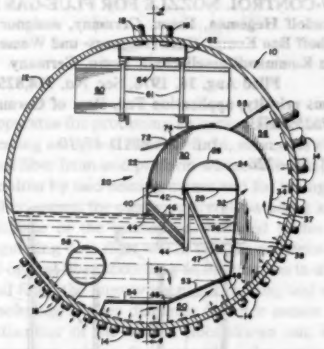
1. An improved gas chromatograph apparatus comprised of a pressure resistant gas chromatograph column, the column having an inlet opening at a first end and an outlet opening at a second end, an injection port means mounted to the column inlet opening, a reservoir of pressurized carrier gas, adjustable inlet pressure regulation means connecting the carrier gas reservoir to the injection port, the injection port means being provided with means for combining sample gaseous mixtures with the pressurized carrier gas and introducing these gases under pressure into the inlet opening of the column, adjustable flow restrictive means, the flow restrictive means being mounted to the column outlet opening, the flow restrictive means being adapted to adjust the pressure within the column in the vicinity of the column outlet opening from 1 atmosphere absolute upward to at least 50 atmospheres absolute pressure, whereby with appropriate adjustment of the flow restrictive means chromatograph separations of sample gas mixtures may be conducted within the column at absolute pressures measured at the column outlet opening in the range upward from one atmosphere to above 50 atmospheres absolute pressure, whereby the velocity of the gases flowing through the column may be adjusted to conform to a preselected value by simultaneously adjusting the flow restricting means at the outlet opening to fix the desired column pressure and adjusting the inlet pressure regulation means to fix the desired carrier gas column pressure, the aforesaid chromatograph apparatus further being a sample collection chamber, the sample collection chamber having an input port and an output port, the sample collection chamber input port being connected to the column outlet opening and the sample collection chamber output port being connected to the adjustable flow restriction means, a stop valve, the stop valve having a first and a second side, the first side being mounted to the flow restriction means and the second side venting to the atmosphere, whereby eluted pressurized samples of gas may be collected at low gas velocities in the sample collection chamber.

4,123,237

LOW PRESSURE DROP GIRTH BAFFLE STEAM SEPARATOR

Albert J. Zipay, Clifton, and Walter P. Gorzegno, Morristown, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Mar. 25, 1977, Ser. No. 781,392
Int. Cl.[2] B01D *19/00, 53/24*
U.S. Cl. 55—205 **17 Claims**



1. A vapor and liquid separator for separating vapor and liquid from a mixture thereof, comprising:

a semi-cylindrical, inner member having a cut-out disposed on a portion of the curved surface;

a semi-cylindrical, outer member concentrically positioned with respect to said inner member to define a curved separation chamber between said inner and said outer members;

an inlet flow passage disposed tangentially with respect to said inner and outer members for the introduction of a mixture of vapor and liquid into said separation chamber;

a plate joining the edges of said inner member to form a flow passage for the separated vapor;

an outlet flow passage directed tangentially with respect to said inner and outer members for the discharge of separated liquid from said separation chamber; and

a perforated member disposed across said outlet flow passage to dissipate the flow velocity of the separated liquid,

whereby the mixture of vapor and liquid introduced into said inlet flow passage impinges upon the inner surface of said outer member, and centrifugal force causes the liquid to separate from the vapor, with the liquid collecting on the inner surface of said outer member and being discharged through said outlet flow passage, and the vapor being discharged through said cutout in said inner member.

6. In combination with a vapor and liquid drum of a vapor generator, said drum having a chamber disposed adjacent one side of the drum for receiving a vapor and liquid mixture, a separator for separating vapor and liquid from the mixture, said separator comprising:

a semi-cylindrical, inner member having a longitudinal cutout disposed on a portion of the curved surface;

a semi-cylindrical, outer member concentrically disposed with respect to said inner member to define a curved separation chamber between said inner and said outer members;

an inlet flow passage extending from said receiving chamber and disposed tangentially with respect to said inner and outer members for introduction of the mixture from said receiving chamber to said separation chamber; and

an outlet flow passage directed tangentially with respect to said inner and outer members for the discharge of separated liquid from said separation chamber,

said mixture being introduced into said inlet passage and impinging upon the inner surface of said outer member, and centrifugal force causing the liquid to separate from the vapor, said liquid collecting on the inner surface of said outer member and discharging through said outlet passage, and the vapor being discharged through said cutout in said inner member.

4,123,238

FLOW-CONTROL NOZZLE FOR FLUE-GAS SCRUBBER

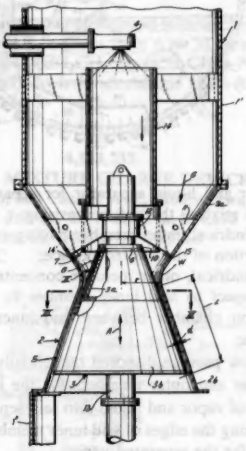
Karl-Rudolf Hegeman, Essen, Germany, assignor to Gottfried Bischoff Bau Kompl. Gastreinigungs- und Wasserruckkuhlanlagen Kommanditgesellschaft, Essen, Germany

Filed Aug. 16, 1976, Ser. No. 714,825

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 7525946[U]

Int. Cl.² B01D *47/10*

U.S. Cl. 55—226 **10 Claims**



1. In a duct traversed by a descending flow of hot flue gases and divided into coaxial upper and lower parts, the upper part of said duct being provided with spray means for irrigating the gas flow with a liquid and being further provided with a stationary central tube extending downwardly from said spray means for the guidance of said liquid, the combination therewith of a flow-controlling nozzle comprising a generally hourglass-shaped tubular body interposed between said parts, said body having a waist substantially narrower than said duct separating a downwardly converging upper portion from a downwardly diverging lower portion of said body, and an insert in said body having a downwardly diverging peripheral surface of generally frustoconical shape which defines with said lower portion a narrow annular channel, said insert being vertically displaceable in said body between several operating positions for varying the width of said channel and being provided with a refractory layer on at least an annular zone of said surface extending above said waist in any of said operating positions, said tube having a bottom edge which lies above said waist and defines with said body a ring space directing the gas flow from around said tube toward said refractory layer.

4,123,239

FILTER IN A CASSETTE FRAME

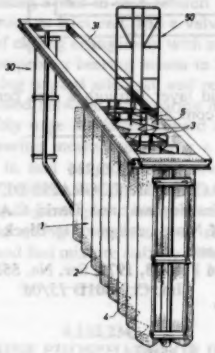
Rune S. Andersson, Växjö, and Svante O. Berglund, Hovmantorp, both of Sweden, assignors to Aktiebolgatet Svenska Flaktfabriken, Nacka, Sweden

Filed Aug. 29, 1977, Ser. No. 828,426

Claims priority, application Sweden, Aug. 31, 1976, 7609625

Int. Cl.² B01D *46/02*

U.S. Cl. 55—379 **4 Claims**



1. For use in a filter housing, at least one filter cassette, and a bag-type filter element supported in said cassette, said filter element comprising a plurality of filter bags forming gas passageways which, at their lower ends are closed, and at their upper ends form a common gas opening, said cassette including a rectangular cassette frame surrounding said upper end, means for fastening the filter element in the cassette frame, and stiffening members telescopically engaged into the gas passageways formed by said bags, wherein the filter element consists of two rows of filter bags which, in the respective rows, are interconnected along their longitudinal side edges, said cassette frame at its end being provided with depending end wall pieces having clamping means detachably engaging the filter element at the ends of said rows to stretch the element, said pieces at their lower ends being rigidly connected to each other at the lower portion of the cassette frame, each of the stiffening members consisting of a substantially plane stiffening element common for two adjacent filter bags each lying in a separate one of said two rows, which element is provided with two legs lying in a plane, each positioned in a respective filter bag, the width of said leg corresponding to the width of the bag in its stretched state, the legs at their upper portions being connected to each other by a stiffening web, whereby said clamping means and stiffening elements maintain said passageways open in their stretched state.

4,123,240

MEANS FOR INTERCEPTING WELD SPLATTER

Michael A. Keresman, Seven Hills, and Curtis H. Schueuerman, Newbury, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

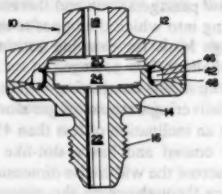
Filed Jun. 14, 1977, Ser. No. 806,381

Int. Cl.² B01D *50/00*

U.S. Cl. 55—385 C **12 Claims**

1. A housing comprising a body and a cover having a flow passage therethrough and joined together by welding of adjacent surfaces thereof, a vent passage between said surfaces and said flow passage, and perforated means between said surfaces and said vent passage for preventing weld splatter produced

during the welding processfrom passing through said vent passage while permitting gases generated during said welding



process to pass through said vent passage into said flow passage.

4,123,241

FILTER

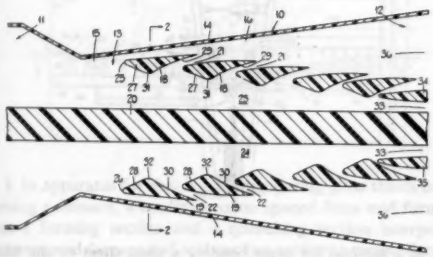
Kenneth H. Maden, Accrington, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 21, 1976, Ser. No. 688,721

Claims priority, application United Kingdom, May 23, 1975, 22571/75

Int. Cl.² B01D *45/18*

U.S. Cl. 55—442 **45 Claims**



1. A filter for separating a stream of mixed materials into a material of greater density and a material of lesser density, said filter comprising a hollow body having an upstream end and a downstream end, means defining an inlet at said upstream end of said body for receiving said stream, means defining a pair of separate outlets at said downstream end of said body for discharging the respective separated materials, said body having a passage extending therethrough from said inlet to said outlets, and at least one set of separator vanes disposed in said body and spaced along said passage, said vanes being positioned to define at least one boundary of a first flow path extending longitudinally of said passage from said inlet to one of said outlets, each separator vane having an upstream edge, a first surface portion which extends from said upstream edge in a downstream direction and which is inclined towards the inlet, a second surface portion which extends downstream from said first portion and which is inclined towards the outlets and an apex junction between said first and second portions, adjacent vanes of said set being mutually spaced longitudinally of said passage so as to define second flow paths therebetween, said second flow paths leading from said first flow path to the other of said outlets, said vanes being so disposed that in each pair of adjacent vanes comprising an upstream vane and a downstream vane the upstream edge of the downstream vane is aligned, longitudinally of said passage with a part of said second surface portion of the upstream vane, said part being spaced downstream from said junction of said upstream vane whereby said junction of said upstream vane masks said second flow path defined between said upstream and said downstream vane against ingress of material of greater density flowing in said stream along said first flow path.

4,123,242

APPARATUS FOR PRODUCING OPTICAL FIBER

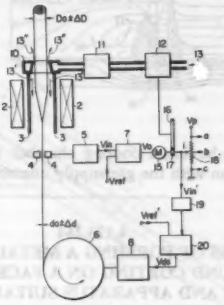
Katsuyuki Imoto, Sayama; Yoshitaka Takasaki, Tokorozawa, and Masao Sumi, Higashiyamato, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 13, 1977, Ser. No. 815,447

Claims priority, application Japan, Jul. 19, 1976, 51-85083

Int. Cl.² C03B *37/02*

U.S. Cl. 65—11 W **6 Claims**



1. In an apparatus for producing an optical fiber comprising means for heating an optical fiber preform, means for drawing out the optical fiber from said preform whose fore end part has been made molten by said heating means and for taking up the drawn out fiber, means for causing gas to flow along an outer peripheral surface of the molten part of said preform, and means for regulating both flow rate of said gas and drawing out speed of said optical fiber according to fluctuations in diameter of said optical fiber, the improvement comprising said regulating means including i) fiber diameter detector means for detecting the diameter of the optical fiber drawn out, ii) fiber diameter measuring means for measuring the optical fiber diameter detected by said detector means, iii) fiber diameter controlling circuit means for receiving and for comparing an output of said fiber diameter measuring means and a reference value for setting a fiber diameter to generate a fiber diameter controlling output, iv) gas flow rate controller means responsive to said fiber diameter controlling output for controlling gas flow, v) take-up speed controlling circuit means for receiving and for comparing a signal corresponding to said fiber diameter controlling output and a reference value for setting a take-up speed to generate a take-up speed controlling output, and vi) optical fiber take-up speed controller means responsive to said take-up speed controlling output for controlling take-up speed.

4,123,243

APPARATUS FOR FORMING FIBERS BY TORATION

Marcel Levecque, Saint-Gratien; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, all of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

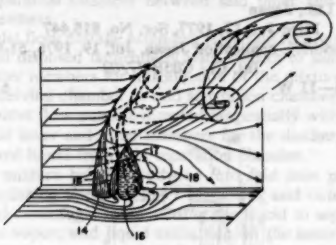
Division of Ser. No. 555,811, Mar. 6, 1975, Pat. No. 4,015,963, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,874,886. This application Apr. 5, 1977, Ser. No. 784,720

Int. Cl.² C03B *37/06*

U.S. Cl. 65—16 **7 Claims**

3. In apparatus for fiberizing attenuable material by feeding a multiplicity of streams of attenuable material into a multiplicity of side-by-side toration zones established by interaction of gaseous jets with a gaseous blast, mechanism for directing gaseous jets toward the blast comprising a manifold having a

gas supply chamber and having a multiplicity of jet delivery passages receiving gas from said supply chamber, and the



manifold also having a cooling chamber therein in heat exchange relation with the gas supply chamber

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4,123,244

PROCESS OF FORMING A METAL OR METAL COMPOUND COATING ON A FACE OF A GLASS SUBSTRATE AND APPARATUS SUITABLE FOR USE IN FORMING SUCH COATING

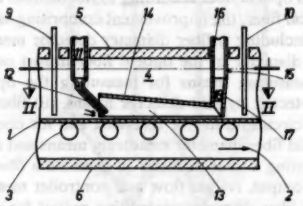
Robert Leclercq, Auvelais; Philéas Capouillet, Gosselies, and Albert Van Cauter, Charleroi, all of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Mar. 28, 1977, Ser. No. 781,958

Claims priority, application United Kingdom, Apr. 13, 1976, 15064/76

Int. Cl.[2] C03C *17/00*

U.S. Cl. 65—60 C **34 Claims**



1. A process of forming a metal or metal compound coating on a face of a flat glas substrate which comprises the steps of contacting such face while it is at elevated temperature with a gaseous medium containing a substance in gaseous phase which undergoes chemical reaction or decomposition to form said metal or metal compound on said face, causing said gaseous medium to flow along said face as a substantially turbulent-free layer along a flow passage defined in part by the face of the glass and in part by a shroud, said flow of gaseous medium being caused in part by delivering a gas stream along a confined path which is at 45° or less to said face and discharging the gas stream from said path into said flow passage through a slot-like discharge mouth extending across the widthwise dimension of said flow passage, and drawing residual medium away from said face through exhaust ducting into which the flow passage leads, said flow passage tapering in the direction of gas flow therethrough at least over an end portion of its length leading up to said exhaust ducting.

21. Apparatus suitable for use in forming a metal or metal compound coating on a face of a flat glass substrate by contacting such face while it is at elevated temperature with a gaseous medium containing a substance in gaseous phase which undergoes chemical reaction or decomposition to form said metal or metal compound on said face, said apparatus comprising:

means for supporting said substrate,

means for heating such substrate,

a shroud mounted in a position to define with the substrate face to be coated a shallow flow passage,

feeding means for discharging gaseous medium into said shallow flow passage at one end thereof, and

exhaust ducting into which the opposite end of said shallow flow passage leads for drawing residual medium away from said shallow flow passage,

said gas feeding means comprising at least one conduit disposed for delivering a stream of gas along a confined path which is at an inclination of less than 45° to the substrate face to be coated and has a slot-like discharge mouth extending across the widthwise dimension of said shallow flow passage through which the stream of gas delivered along said confined path is discharged into said shallow flow passage, said shroud being formed such that the flow passage tapers toward said opposite end thereof.

4,123,245

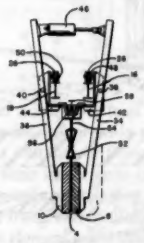
APPARATUS AND METHOD FOR PRESS BENDING AND TEMPERING GLASS SHEETS AND THE LIKE

William G. Bates, Sellersville, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Oct. 25, 1977, Ser. No. 845,339

Int. Cl.[2] C03B *23/02*

U.S. Cl. 65—104 **20 Claims**



1. In a method for press bending a glass sheet or the like, wherein the sheet is heated at a temperature sufficient to effect deformation thereof, said sheet depends from a carriage assembly, a pair of complementary shaping members depends from a shaping member assembly, said carriage assembly adapted to engaged said shaping member assembly to align said sheet with said shaping member, and wherein said sheet is sandwiched between said pair of complementary shaping members and cooled in a quench to temper the sheet, the steps comprising:

(a) keeping the sheet heated in a holding area immediately after it has left the furnace,

(b) providing alignment between said sheet while in said holding are with said shaping member,

(c) synchronously transporting by a common drive said sheet and shaping members toward said quench, and

(d) squeezing said sheet between the shaping members to press bend said sheet on the run while concurrently transferring it toward the quench.

11. In an apparatus for press shaping glass sheets and the like which apparatus includes a means adapted to heat the sheets to the desired deformation temperature, a quench downstream from the heating means, sheet grasping means and a pair of complementary shaping members which are spaced on opposite sides of the grasping means and adapted to impart the desired shape to the sheet interposed therebetween, the combination which comprises:

(a) a heated holding station located between the heating means and the quench;

(b) a shaping member assembly for transporting said shaping members;

(c) a sheet carriage assembly in communication with said sheet grasping means for transporting the sheet from the heating means to the quench, said sheet carriage assembly

adapted to engage said shaping member assembly for alignment of said sheet with said shaping members;

(d) drive means for transporting both the sheet and the shaping members concurrently from the holding area toward the quench; and

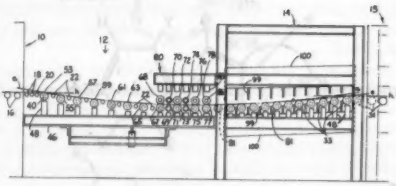
(e) means for moving at least one of the shaping members toward the other to press the sheet into the desired shape while the shaping members and the sheet travel substantially in unison toward the quench.

4,123,246

SHAPING AND QUENCHING GLASS SHEETS BY ROLL FORMING USING TRANSITION QUENCH ROLLS

Randall S. Johnson, Bellwood, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 26, 1978, Ser. No. 872,409
Int. Cl.² C03B *23/02*
U.S. Cl. 65—104 **10 Claims**



1. In apparatus for shaping and tempering glass sheets comprising a furnace, a cooling section spaced from said furnace and a forming section and a quenching section interposed between said furnace and said cooling section, a series of rotating forming rolls longitudinally spaced from one another along a generally arcuate path of approximately constant longitudinal curvature through said forming section and within at least a major portion of said quenching section, wherein the rotating rolls of said series within said quenching section closer to said cooling section are disposed in an upwardly sloped portion of said arcuate path whose upward slope increases to a slope at which a glass sheet would slip when engaged by adjacent rotating rolls disposed along said path, the improvement comprising means supporting said adjacent rotating rolls in said quenching section disposed in said upwardly sloped portion in such relative vertical positions of misalignment with said arcuate path that the maximum upward slope from roll to roll is less than an upward slope at which the glass sheets would slide relative to said adjacent rotating rolls.

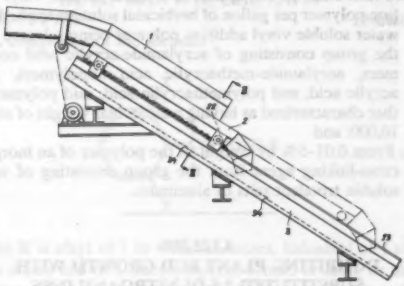
8. In a method of shaping and tempering a series of glass sheets by the roll forming process comprising heating a plurality of glass sheets to a glass deformation temperature and conveying each of said plurality of glass sheets on a series of rotating forming rolls disposed along an arcuate path of substantially constant radius of curvature having a generally descending portion adjacent where the glass sheets are heated to shape said glass sheets to a curvature conforming to said arcuate path, and cooling said shaped glass sheets while conveyed on additional rotating rolls disposed along a continuation of said arcuate path rapidly enough to harden the glass sheet surfaces, the improvement comprising transferring said glass sheets after their surfaces have hardened to rotating rolls disposed along a line having a maximum upward slope from roll to roll less than an upward slope at which the glass sheet would slide relative to said rotating rolls.

4,123,247

APPARATUS FOR EXPANDING METALLURGICAL SLAG

Paul Metz, Luxembourg; Robert Schockmel, Esch, Alzette, and Roland Mersch, Dudelange, all of Luxembourg, assignors to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED, Luxembourg, Luxembourg

Filed Nov. 15, 1977, Ser. No. 851,636
Claims priority, application Luxembourg, Nov. 17, 1976, 76218; Sep. 26, 1977, 78186
Int. Cl.² C03B *19/08*
U.S. Cl. 65—141 **12 Claims**



1. An apparatus for expanding a molten slag which comprises:

a fixed inlet trough inclined downwardly and having a discharge edge;

a movable intermediate trough disposed below said discharge edge and shiftable relative to said inlet trough;

a fixed prefoaming trough disposed below said intermediate trough and parallel thereto, said intermediate trough having a discharge side shiftable relative to said prefoaming trough to vary the point therealong at which molten slag is delivered to said prefoaming trough, said prefoaming rough being provided with means for contacting molten slag along a path extending along said prefoaming trough and of a length corresponding to the point at which said molten slag is delivered thereto, with a water film; and

further means downstream of said prefoaming trough for further expanding the slag pre-expanded on said prefoaming trough.

4,123,248

CONTROLLED RELEASE FERTILIZER

Cyril F. Drake, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 25, 1977, Ser. No. 827,469
Int. Cl.² C05B *17/00, 19/00*
U.S. Cl. 71—4 **11 Claims**

1. A slow release fertilizer composition comprising a vitreous matrix including a water soluble nitrogen source fertilizer material, a glass modifier, and as a glass former, phosphorous pentoxide, all within the matrix; the vitreous matrix including one or more inorganic oxide phases dispersed therein, the vitreous matrix having a low rate of solution in water such that when the composition is immersed in water the fertilizer is slowly released into solution, wherein said nitrogen source fertilizer material is an inorganic nitrogen containing compound stable at the fusing temperature of the glass being formed.

7. A fertilizer composition as claimed in claim 1 wherein the fertilizer composition contains one or more inorganic fungicides.

4,123,249
AQUATIC HERBICIDES

Joseph F. Vartiak, Naperville, Ill., and George E. Wortley, Jr., Longwood, Fla., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Aug. 18, 1977, Ser. No. 825,796
The portion of the term of this patent subsequent to Feb. 28, 1994, has been disclaimed.
Int. Cl.[2] A01N *17/00*
U.S. Cl. 71—66 **7 Claims**

1. A process for improving the activity of aquatic herbicides which comprises applying these herbicides under water to the vegetation to be controlled in the presence of:

A. From 0.005 to 0.2 pounds of a water soluble vinyl addition polymer per gallon of herbicidal solution applied, said water soluble vinyl addition polymer being selected from the group consisting of acrylamide-acrylic acid copolymers, acrylamide-methacrylic acid copolymers, polyacrylic acid, and polymethacrylic acid, said polymer further characterized as having a molecular weight of at least 10,000; and

B. From 0.01–5% by weight of the polymer of an inorganic cross-linking agent from the group consisting of water-soluble trivalent salts of aluminum.

4,123,250
INHIBITING PLANT BUD GROWTH WITH SUBSTITUTED 2,6-DI-NITROANILINES

Robert H. Kupelian, Bucks County, Pa., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 245,646, Apr. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,538, Jun. 30, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,193
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—78 **10 Claims**

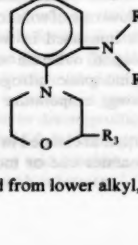
1. A method for inhibiting the bud growth on plants comprising contacting the plants with a bud growth inhibiting amount of a compound which is N-sec-butyl-3,4-dimethyl-2,6-dinitroaniline, 3,4-dimethyl-2,6-dinitro-N-(3-pentyl)aniline, 4-chloro-2,6-dinitro-N-[1-(methoxymethyl)propyl]-m-toluidine, 3,4-dimethyl-2,6-dinitro-N-(2-methoxy-1-methylethyl-)aniline, 3-methoxy-2,6-dinitro-N-(3-pentyl)-p-toluidine, 4-chloro-2,6-dinitro-N-(1,3-dimethylbutyl)-m-toluidine, 3,4-dimethyl-2,6-dinitro-N-(2-pentyl)aniline, 3,4-dimethyl-2,6-dinitro-N-(3-hexyl)aniline, N-sec-butyl-3-methyl-4-chloro-2,6-dinitroaniline, 4-chloro-2,6-dinitro-N-(3-pentyl)-m-toluidine, 4-chloro-2,6-dinitro-N-(2-pentyl)-m-toluidine, or 4-trifluoromethyl-2,6-dinitro-N-(3-pentyl)-m-toluidine.

4,123,251
O-AMIDOPHENYLMORPHOLINE COMPOUNDS AND METHOD OF USE

Kelvin K. Shen, Fountain Valley, Calif., and Wayne S. Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Jun. 2, 1977, Ser. No. 802,606
Int. Cl.[2] C07D *295/12*; A01N *9/28*
U.S. Cl. 71—88 **16 Claims**

1. A compound of the formula



wherein X is selected from lower alkyl, halo, halo-lower alkyl, lower alkylsulfonyl, and halo-lower alkylsulfonyl, R_1 is selected from

$$C_{1-3}\text{ alkyl}-\overset{O}{\overset{\|}{C}}-,\quad C_{1-3}\text{ alkenyl}-\overset{O}{\overset{\|}{C}}-,$$

and the halo and lower alkoxy substituted derivatives thereof, R_2 is selected from the group consisting of hydrogen and the groups represented by R_1, and R_3 is selected from hydrogen and alkyl of 1 to 3 carbon atoms.

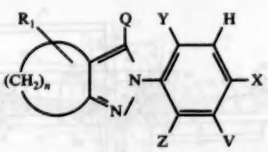
9. The method of controlling undesirable plant growth which comprises applying a phytotoxic amount of a compound according to claim 1 to the locus of said plants.

4,123,252
METHOXY SUBSTITUTED CYCLOALKANAPYRAZOLE HERBICIDES

Steven J. Goddard, West Grove, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 649,901, Jan. 16, 1976, abandoned. This application Sep. 24, 1976, Ser. No. 726,295
Int. Cl.[2] A01N *9/22*; C07D *231/54, 231/56*
U.S. Cl. 71—92 **53 Claims**

1. A compound of the formula



where

n is 3, 4 or 5;
Q is —O—CH_3 or —S—CH_3—;
R_1 is hydrogen or methyl;
V is hydrogen, fluorine or chlorine;
X is fluorine, chlorine, bromine, iodine, cyano or methoxy;
Y is hydrogen, fluorine or chlorine; and
Z is hydrogen or fluorine; and

with the proviso that:

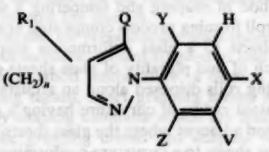
(a) when *n* is 3, R_1 is hydrogen, and when V is fluorine or chlorine, X is fluorine, chlorine or bromine and Z is hydrogen;

(b) when *n* is 4 and V is fluorine or chlorine, X is fluorine, chlorine or bromine and Z is hydrogen; and

(c) when *n* is 5, R_1 is hydrogen, Y is hydrogen or fluorine, Z and V are hydrogen, X is fluorine, chlorine or bromine.

11. A composition for the control of undesirable vegetation consisting essentially of a herbicidally effective amount of a compound of claim 1 and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

42. A compound of the formula



where

n is 3 or 4;
Q is —$S(O)_m$—CH_3;
m is 1 or 2;
R_1 is hydrogen or methyl;
V is hydrogen;
X is fluorine, chlorine, bromine, iodine, cyano or methoxy;
Y is fluorine; and

Z is hydrogen; and
with the proviso that:
(a) when n is 3, R_1 is hydrogen.

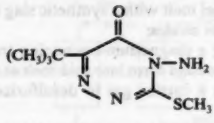
44. A composition for the control of undesirable vegetation consisting essentially of a herbicidally effective amount of a compound of claim 42 and at least one of (a) a surface-active agent and (b) a solid or liquid diluent.

4,123,253
HERBICIDAL COMPOSITIONS

Helmut Hack, Odenthal; Robert R. Schmidt, Cologne, and Karl-fried Dickoré, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

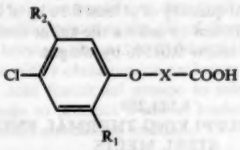
Filed Sep. 10, 1976, Ser. No. 722,305
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2543974
Int. Cl.² A01N 9/22, 9/02
U.S. Cl. 71—93 16 Claims

1. Herbicidal composition for the selective combating of weeds in cereal cultures, containing as active ingredients (1) a 1,2,4-triazin-5(4H)-one derivative of the general formula



(I),

and (2) a phenoxyalkanecarboxylic acid of the general formula



(II)

in which
X is methylene or methylmethylene,
R_1 is chlorine or methyl and
R_2 is hydrogen or chlorine,
which acid may be in the form of a salt or ester thereof, the weight ratio of (1) to (2) being about 1:2–5.

4,123,254
GERMICIDAL HERBICIDE FOR AGRICULTURE AND HORTICULTURE

Tetsuji Iwasaki; Norioki Miyamoto; Yukio Sugimura; Kyozaburo Tachibana, and Tsuneyuki Takeno, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1977, Ser. No. 809,023
Claims priority, application Japan, Jun. 30, 1976, 51/77194; Jun. 30, 1976, 51/77197
Int. Cl.² A01N 9/12, 9/14
U.S. Cl. 71—98 7 Claims

1. A method of inhibiting the growth of noxious weeds which comprises applying a herbicidally effective amount of at least one compound of the formula:

R—X—CH=CH—COOY

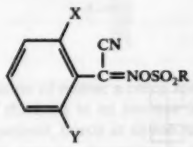
wherein R represents an alkyl or alkenyl group having 1 to 20 carbon atoms, X represents S, SO or SO_2, and Y represents a hydrogen atom, an alkali metal, an alkaline earth metal, NH_4, an alkenyl group having 1 to 20 carbon atoms, a polyalcohol residue which may have therein ether bonds formed by intramolecular or intermolecular dehydration, an acetal glycerol residue, or an oxyethylene (1 to 20 units) or oxypropylene group (1 to 20 units) terminated by an alkyl group having 1 to 20 carbon atoms.

4,123,255
O-SULFONYL-ALPHA-CYANO 2,6-DIHALOBENZALDOXIMES

Francis J. Freenor, III, Richmond, and Barbara M. Koerber, Berkeley, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 3, 1977, Ser. No. 756,566
Int. Cl.² A01N 9/14; C07C 121/66
U.S. Cl. 71—103 19 Claims

1. A compound of the formula



wherein R is alkyl of 1 to 4 carbon atoms, haloalkyl of 1 to 4 carbon atoms and of 1 fluoro, chloro, bromo or iodo, or dialkylamino of 2 to 6 carbon atoms, X is chloro or bromo and Y is chloro or bromo.

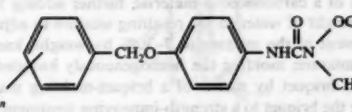
7. A method for the control of undesirable vegetation which comprises applying thereto a herbicidally effective amount of the compound defined in claim 1.

4,123,256
N-(4-SUBSTITUTED BENZYLOXY)PHENYL)-N-METHYL-N-METHOXYUREA

Ryo Yoshida, Kawanishi; Ichiki Takemoto, Toyonaka; Seizo Sumida, Nishinomiya, and Katsuzo Kamoshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

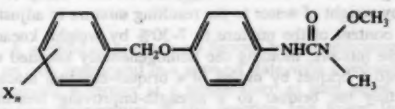
Filed Sep. 22, 1977, Ser. No. 835,745
Claims priority, application Japan, Sep. 30, 1976, 51-118046
Int. Cl.² C07C 69/76, 121/75; A01N 9/20
U.S. Cl. 71—105 11 Claims

1. A compound of the formula:



wherein X, which may be the same or different, is halogen, nitro, cyano, trifluoromethyl, lower alkyl or lower alkoxy and n is an integer of 1 to 5.

8. A herbicidal composition which comprises as an active ingredient a herbicidally effective amount of a compound of the formula:



wherein X, which may be the same or different, is halogen, nitro, cyano, trifluoromethyl, lower alkyl or lower alkoxy and n is an integer of 1 to 5, and an inert carrier.

4,123,257

METHOD OF TREATING A PLATING SLUDGE

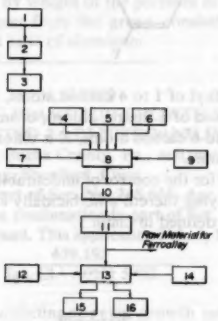
Hiroshi Fukuoka, Tokuyama; Teruhiko Kameyama, Shinnanyo; Yoshio Tanaka, Tokuyama; Hideyo Suzuki, Yokohama, and Kimiaki Imai, Narashino, all of Japan, assignors to Nisshin Steel Company Ltd. and Japan Metals & Chemicals, Co., Ltd., both of, Japan

Filed Jun. 13, 1977, Ser. No. 806,096

Claims priority, application Japan, Jun. 25, 1976, 51-74377

Int. Cl.² C21B *13/00*; C22B *1/24*

U.S. Cl. 75—40 **16 Claims**



1. A method of treating a plating sludge comprising mixing 100 parts by weight of a plating sludge, whose water content is decreased to not higher than 10% by weight, with 10–100 parts by weight of scale, 10–200 parts by weight of dust, both of the scale and dust being formed in the production of alloy steel, 10–100 parts by weight of a binder, and not larger than 40 parts by weight of a carbonaceous material; further adding 10–200 parts by weight of water to the resulting mixture to adjust the water content of the mixture to 7–30% by weight; kneading fully the mixture; molding the homogeneously kneaded mixture into a briquet by means of a briquet-molding machine; subjecting the briquet to a strength-improving treatment to use the above treated briquet as a raw material for ferroalloy.

8. A method of treating a plating sludge comprising mixing 100 parts by weight of a plating sludge, whose water content is decreased to not higher than 10% by weight, with 10–100 parts by weight of scale, 10–200 parts by weight of dust, both of the scale and dust being formed in the production of alloy steel, 10–100 parts by weight of a binder, and not larger than 40 parts by weight of a carbonaceous material; further adding 10–200 parts by weight of water to the resulting mixture to adjust the water content of the mixture to 7–30% by weight; kneading fully the mixture; molding the homogeneously kneaded mixture into a briquet by means of a briquet-molding machine; subjecting the briquet to a strength-improving treatment; charging the above treated briquet into a reduction-smelting furnace together with a carbonaceous reducing agent; subjecting the mixture to a reduction smelting in the furnace to recover metal for use as a raw material for alloy steel.

4,123,258

PROCESS FOR THE PRODUCTION OF STEEL WITH INCREASED DUCTILITY AND FOR THE DESULFURIZATION OF A STEEL MELT

Wilhelm Klapdar, Essen; Helmut Richter, Oberhausen; Heinrich-Wilhelm Rommerswinkel, Mühlheim/Ruhr; Edgar Spetzler, and Jochen Wendorff, both of Oberhausen, all of Germany, assignors to Thyssen Niederrhein, Oberhausen, Germany

Continuation-in-part of Ser. No. 742,363, Nov. 11, 1976, Pat. No. 4,067,730, which is a continuation of Ser. No. 569,150, Apr. 18, 1975, Pat. No. 3,992,195. This application Aug. 16, 1977, Ser. No. 825,103

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1974, 2419070; Apr. 20, 1974, 2419176

Int. Cl.² C21C *7/02*

U.S. Cl. 75—58 **5 Claims**

1. A process for the production of steel of high ductility comprising the steps of:

(a) deoxidizing a sulfur-containing starting steel melt having a sulfur content of at least 0.02% by weight;

(b) maintaining the deoxidized steel melt in a ladle having a lining free from siliceous oxides;

(c) covering said steel melt with a synthetic slag substantially free from siliceous oxides;

(d) slowly injecting a magnesium-containing treating agent in fine-grain particulate form into said melt at a depth of at least 2000 mm in a carrier gas to desulfurize and purify said melt; and

(e) maintaining the rate of introduction of said magnesium-containing agent in step (d) at most equal to the rate at which said agent is able to react with said melt, said agent being introduced into said melt over a period of at least 5 minutes in a total quantity of at least 0.36 kg of Mg per ton of steel and sufficient to reduce the sulfur content of the melt to a value below 0.015% by weight.

4,123,259

METHOD FOR SUPPLYING THERMAL ENERGY TO STEEL MELTS

Helmut Knüppel; Karl Brotzmann, and Hans G. Fassbinder, all of Sulzbach-Rosenberg, Germany, assignors to Eisenwerk-Gesellschaft Maximilianshutte mbH, Sulzbach-Rosenberg, Germany

Filed May 20, 1977, Ser. No. 799,029

Int. Cl.² C21C *5/34*

U.S. Cl. 75—60 **2 Claims**

1. A process for increasing the amount of scrap which can be melted in a refining vessel equipped with at least one tuyere comprising at least two concentric pipes mounted in the refractory masonry of the refining vessel underneath the surface of a melt in said vessel to produce a steel melt by supplying thermal energy to said steel melt, which process comprises: introducing a stream of oxygen and a stream of protective medium selected from the group consisting of hydrocarbons and mixtures thereof through said tuyere and into a pig iron melt in said vessel; refining said pig iron melt to a carbon content of not more than 0.05% by blowing oxygen and said hydrocarbon protective medium around said oxygen through said tuyeres and into said melt, the proportions of hydrocarbon to oxygen being such that the tuyere is protected from destructive burnback; and thereafter, after said melt has been refined to a carbon content of not more than about 0.05%, blowing oxygen and carbon-containing fuel into said melt through said tuyere thereby burning said carbon-containing fuel with said oxygen and passing the hot gases resulting from the combustion of said fuel with said oxygen through said melt, the relative proportions of said fuel to said oxygen being substantially greater than the proportion of hydrocarbon to oxygen used to protect said tuyere during said refining and being sufficient to completely burn said fuel so as to produce a hot combustion gas containing substantial amounts of CO_2 whereby said melt is heated by passage of said combustion gas through said melt and therefore

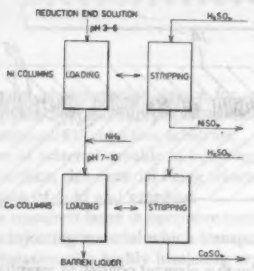
the amount of scrap which can be melted is increased as compared with that which can be melted in an otherwise similar process, without the additional step of blowing oxygen and said carbon-containing fuel into said melt.

4,123,260

SELECTIVE RECOVERY OF NICKEL AND COBALT OR COPPER AND ZINC FROM SOLUTION

Verner B. Sefton, Edmonton, and Russell P. Kofluk, Opal, both of Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed May 12, 1977, Ser. No. 796,495
Claims priority, application Canada, Feb. 25, 1977, 272687
Int. Cl.[2] C22B *15/08, 19/22*
U.S. Cl. 75—117 26 Claims



1. A process for separately recovering nickel and cobalt from a feed solution containing dissolved nickel and cobaltous cobalt, including adjusting the pH of the solution if necessary to a value between about 3 and about 6, and then contacting the solution with a chelating ion exchange resin having aminocarboxylic acid functional groups to selectively load nickel onto the resin to produce a nickel loaded resin and a nickel depleted cobalt containing solution.

4,123,261

TITANIUM-STABILIZED DEEP DRAWING STEEL SUITABLE FOR HOT GALVANIZING

Karl-Erik Moren, and Par S. Sixtensson, both of Borlange, Sweden, assignors to Stora Kopparbergs Bergslags AB, Falun, Sweden

Filed Oct. 5, 1977, Ser. No. 839,417
Claims priority, application Sweden, Oct. 21, 1976, 7611673
Int. Cl.[2] C22C *38/42, 38/50*
U.S. Cl. 75—125 2 Claims

1. A titanium-stabilized deep drawing steel suitable for hot galvanizing which contains up to about 0.02 weight percent carbon, up to about 0.04 weight percent manganese, from about 0.01 to about 0.4 weight percent titanium, from about 0.04 to about 1.0 weight percent chromium, from about 0.04 to about 1.0 weight percent copper, and about 0.02 to about 0.05 weight percent nickel.

4,123,262

DENTAL GOLD ALLOY

Paul J. Cascone, New Rochelle, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Jul. 6, 1977, Ser. No. 813,363
Int. Cl.[2] C22C *5/00*
U.S. Cl. 75—165 10 Claims

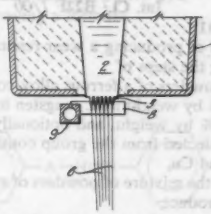
1. A dental gold alloy consisting, in percent by weight, of about: 50 to 58% gold, 0.5 to 10.5% indium, 0.5 to 8.5% tin or 1.0 to 3.0% gallium, and the balance palladium; said alloy being non-staining and bondable to porcelain, castable without difficulty below 2500° F., and having at least 10% elongation in one inch.

4,123,263

PLATINUM-RHODIUM ALLOYS

Darryl J. Costin, Columbus, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 2, 1977, Ser. No. 847,887
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] C22C *5/04*
U.S. Cl. 75—172 R 20 Claims



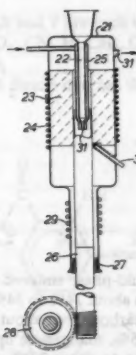
1. As a composition of matter a creep resistant alloy consisting essentially of rhodium in an amount of from about 10 to about 40 weight percent, boron in an amount of about 0.002 to about 0.05 weight percent, zirconium is an amount of about 0.064 to about 0.27 weight percent and the balance of said composition being platinum.

4,123,264

PRODUCTION OF FERROUS BODIES

Ralph V. Riley, Stamford; Samuel Muir, Nr. Market Harborough; Christopher Bloor, Corby, and Tibor Jozsef, Gretton, all of England, assignors to British Steel Corporation, United Kingdom

Filed Apr. 8, 1974, Ser. No. 458,601
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—211 21 Claims



1. A method of producing a ferrous body comprising reacting an iron compound in a gaseous state with a reducing gas, maintaining a former at a temperature at least equal to the reduction temperature of the reaction and lower than the melting point of iron and maintaining turbulent gas flow conditions adjacent said former to deposit iron on said former as a solid ferrous body of crystalline form.

4,123,265
METHOD OF PRODUCING FERROUS SINTERED ALLOY OF IMPROVED WEAR RESISTANCE

Kentaro Takahashi, and Shigeru Urano, both of Ohmiya, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 671,781, Mar. 30, 1976, abandoned, and a continuation-in-part of Ser. No. 551,815, Feb. 21, 1975, abandoned. This application Feb. 23, 1977, Ser. No. 771,854
Claims priority, application Japan, Feb. 21, 1974, 49-19971
Int. Cl.² B22F *1/00*
U.S. Cl. 75—211 **2 Claims**

1. A method of producing a wear-resistant sintered ferrous alloy including the steps of

(1) mixing powders of a ferrous alloy containing more than about 50% by weight iron, tungsten in the range of about 0.5 to 5.0% by weight, and optionally at least one of an element selected from the group consisting of C, Ni, Mn, Mo, Cr and Cu,

(2) sintering the mixture of powders of step (1) to produce a sintered product,

(3) infiltrating into the sintered product of step (2) a component selected from the group consisting of copper or a copper alloy principally containing copper at a temperature above the melting point of the copper or the copper alloy to produce an infiltrated sintered product and

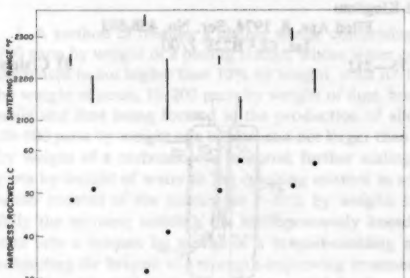
(4) cooling the infiltrated sintered product of step (3);

the improvement comprising said mixture of powders of step (1) having a composition sufficient to cause the production of martensite and bainite matrixes during the cooling step (4) in an amount of at least about 10% of the alloy microstructure.

4,123,266
SINTERED HIGH PERFORMANCE METAL POWDER ALLOY

Edward M. Foley, Russiaville; Dennis G. Dreyer, Kokomo, and Herbert E. Rogers, Jr., Sharpsville, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Continuation of Ser. No. 344,753, Mar. 26, 1973, abandoned. This application Jan. 19, 1978, Ser. No. 870,917
Int. Cl.² B22F *3/00*
U.S. Cl. 75—244 **10 Claims**



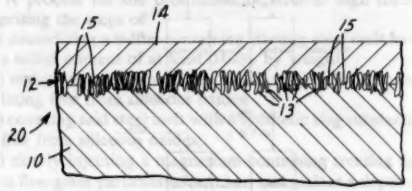
1. An article of liquid-phase sintered metal powder consisting of chromium from about 24% to 34%, tungsten from about 3.5% to about 20%, carbon from about 0.08% to about 3.5%, silicon up to about 1.5%, manganese up to about 1%, iron up to about 5%, nickel up to about 3.0%, boron about 0.43% to about 0.56%, molybdenum up to about 1.5%, and the balance cobalt and incidental impurities, said boron present to provide a wider sintering temperature range of the metal powder.

6. In a process for the production of a dense article from high performance cobalt-base alloy powder including the steps of consolidating the powder under pressure into an article of the desired shape and then sintering that article, the improvement comprising incorporating boron in the powder in an amount about 0.43% to about 0.56% by weight thereby providing a wider sintering temperature range, and liquid-phase sintering the article at a temperature between the solidus and liquidus temperature of the alloy.

4,123,267
PHOTOCONDUCTIVE ELEMENT HAVING A BARRIER LAYER OF ALUMINUM HYDROXYOXIDE

Gary L. Dorer, Taunton, Mass., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 27, 1977, Ser. No. 810,577
Int. Cl.² G03G *5/04*
U.S. Cl. 96—1 PC **7 Claims**



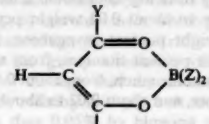
1. A photoconductive element consisting essentially of (a) an electrically conductive substrate, (b) a layer of aluminum hydroxyoxide crystallites on said substrate, and (c) a continuous photoconductive layer over said layer of crystallites wherein said photoconductive layer is selected from selenium, selenium compounds and alloys of selenium.

4,123,268
BORON CHELATES AS ACCEPTOR TYPE SENSITIZERS FOR PHOTOCONDUCTIVE POLYMERS

James M. Halm, Lombard, Ill. assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Jun. 22, 1977, Ser. No. 808,859
Int. Cl.² G03G *5/09, 5/04*
U.S. Cl. 96—1 PC **22 Claims**

1. A method of making a reproduction comprising the steps of applying an electrostatic charge to an organic photoconductive polymer of the electron donor type sensitized with a compound of the formula:



where X and Y each independently is a member selected from the group consisting of alkyl, aryl and electron withdrawing alkyl and electron withdrawing aryl and Z is a member selected from the group consisting of fluoro and phenyl, said compound being present in an amount ranging from 0.1 mole to 100 moles per 100 moles of polymer, the molecular weight of said polymer being taken as the weight of the monomer;

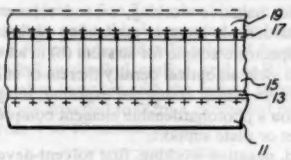
exposing the charged polymer to a pattern of light and shadow comprising electromagnetic radiation in the visible range to produce a latent image thereon; and

applying electroscopic powder to produce a material image corresponding to said pattern of light and shadow.

4,123,269
ELECTROSTATOGRAPHIC PHOTOSENSITIVE DEVICE COMPRISING HOLE INJECTING AND HOLE TRANSPORT LAYERS

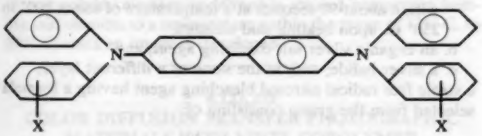
Donald C. Von Hoene; Joseph Y. C. Chu, both of Fairport; Inan Chen, Webster, and Robert N. Jones, Fairport, all of N.Y., assignors to Xerox Corporation, Stamfod, Conn.

Filed Sep. 29, 1977, Ser. No. 837,666
Int. Cl.[2] G03G 5/04
U.S. Cl. 96—1 PC **14 Claims**



1. A layered photosensitive device for use in electrostatographic copying which comprises from the bottom up:
(a) an electrically conductive substrate;
(b) a layer of material capable of injecting holes into a layer on its surface, this material being selected from the group consisting of gold and graphite;
(c) a hole transport layer in operative contact with the layer of hole injecting material which transport layer comprises a combination of a highly insulating organic resin having dispersed therein small molecules of an electrically active material, the combination of which is substantially non-absorbing to visible light but allows injection of photogenerated holes from a charge generator in contact with said hole transport layer and electrically induced holes from the layer of injecting material;
(d) a layer of a charge generating photoconductive material on and in operative contact with the charge transport layer; and
(e) a layer of an insulating organic resin overlaying the layer of charge generating material.

2. The device of claim 1 wherein the electrically active material dispersed in the insulating organic resin is a nitrogen containing composition of the formula:



wherein X is (ortho) CH_3, (meta) CH_3, (para) CH_3, (ortho) Cl, (metal) Cl or (para) Cl.

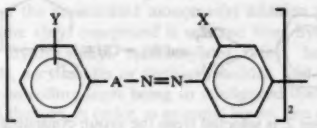
7. The device of claim 1 wherein the highly insulating organic resin in the hole transport layer is a polycarbonate, an acrylate polymer, a vinyl polymer, a cellulose polymer, a polyester, a polysiloxane, a polyamide, a polyurethane or an epoxy.

4,123,270
METHOD OF MAKING ELECTROPHOTOGRAPHIC IMAGING ELEMENT

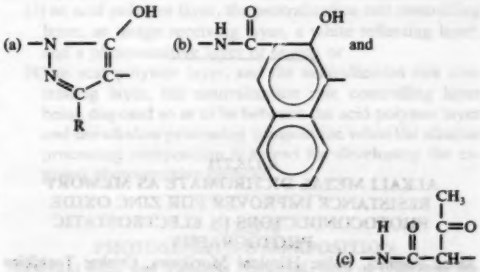
Walter P. Heil, and David B. Sclove, both of Boulder County, Colo., assignors to International Business Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 613,595, Sep. 15, 1975, abandoned. This application Jan. 12, 1976, Ser. No. 648,610
Int. Cl.[2] G03G 5/06, 5/05
U.S. Cl. 96—1.5 R **18 Claims**

1. The process of manufacturing an electrophotographic imaging element including an electrically conductive substrate comprising the steps of:
essentially completely dissolving organic primary amine soluble dyes capable of charge generations in a solvent which contains an organic primary amine as a portion of the solvent,
said charge generating material selected from the group consisting of at least one organic primary amine soluble disazo and squaric acid derivative dye;
said disazo dye having a formula

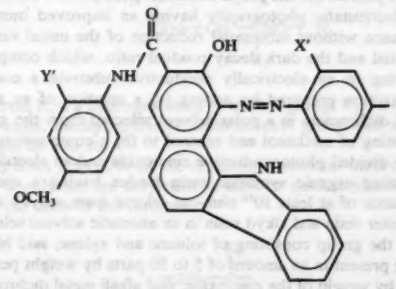


wherein A is selected from the group consisting of:

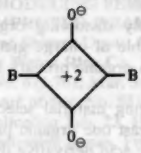


wherein R is selected from the group consisting of lower alkyl and

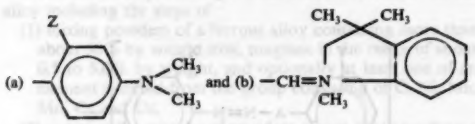
lower alkyl, and X and Y are each selected from the group consisting of: NO_2, CN, H, CH_3, OCH_3, OC_2H_5, OH, Cl, Br, and $N(C_2H_5)_2$
or wherein the said disazo dye has the formula



wherein Y' is H or CH_3 and X' is H or Cl.
and said derivatives of squaric acid include those having the formula



wherein B is selected from the group consisting of



wherein Z is selected from the group consisting of H, OH and CH_3;

and then coating the resulting solution onto said conductive substrate.

4,123,271

ALKALI METAL DICHROMATE AS MEMORY RESISTANCE IMPROVER FOR ZINC OXIDE PHOTOCONDUCTORS IN ELECTROSTATIC PHOTOGRAPHY

Akira Fushida, Suita; Hiroichi Morikawa, Osaka; Toshihiro Shinsho, Katano; Takaaki Miyazaki, Daito, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 435,576, Jan. 22, 1974, abandoned. This application Nov. 23, 1976, Ser. No. 744,450

Int. Cl.[2] G03G *7/00*

U.S. Cl. 96—1.8 **2 Claims**

1. A process for the preparation of a photosensitive material for electrostatic photography having an improved memory resistance without substantial reduction of the initial surface potential and the dark decay residual ratio, which comprises applying to an electrically conductive substrate a coating composition prepared by adding (a) a solution of an alkali metal dichromate in a polar solvent selected from the group consisting of methanol and ethanol to (b) a composition of a finely divided photoconductive zinc oxide and an electrically insulating organic synthetic resin binder having a specific resistance of at least 10^{14} ohm-cm selcted from acrylic resin, polyester resin and alkyd resin in an aromatic solvent selected from the group consisting of toluene and xylene, said binder being present in an amount of 5 to 50 parts by weight per 100 parts by weight of the zinc oxide, said alkali metal dichromate being present in an amount of 0.001 to 0.01% by weight based on the zinc oxide, said coating composition being applied in a coated amount of 5 to 50 g/m^2, and then drying the coating composition.

4,123,272

DOUBLE-NEGATIVE POSITIVE-WORKING PHOTOHARDENABLE ELEMENTS

John A. Quinn, Morganville, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 17, 1977, Ser. No. 797,832

Int. Cl.[2] G03C *1/68*

U.S. Cl. 96—35.1 **19 Claims**

1. A photohardenable element comprising in order

(a) a sheet or plate support;

(b) a solid, negative-working, first solvent-developable photohardenable stratum;

(c) a solid, negative-working, second solvent-developable photohardenable stratum containing radiation absorbers in the spectrum actinic for stratum (b) in an amount sufficient to yield an optical density therein of at least 1.0 unit.

10. A process which comprises exposing, imagewise to actinic radiation a photohardenable element comprising in order

(a) a sheet or plate support;

(b) a solid, negative-working, first solvent-developable photohardenable stratum;

(c) a solid, negative-working, second solvent-developable photohardenable stratum containing radiation absorbers in the spectrum actinic for stratum (b) in an amount sufficient to yield an optical density therein of at least 1.0 unit;

removing the unexposed areas of stratum (c) with said second solvent which has no affect on stratum (b); exposing the resulting element to actinic radiation through the remainder of stratum (c) until the exposed areas of photohardenable stratum (b) are polymerized without polymerization in the unexposed areas; removing the exposed areas of stratum (c) and removing the unexposed areas of stratum (b) with said first solvent.

4,123,273

STABLE FREE RADICAL NITROXYL BLEACHING AGENTS FOR PHOTOGRAPHIC PROCESSES

Samuel Ciurca, Jr., Rochester, and Carl F. Kohrt, Pittsford,both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,620

Int. Cl.[2] G03C *1/02, 5/30*

U.S. Cl. 96—66 T **20 Claims**

1. A photothermographic element comprising a support having thereon a layer comprising:

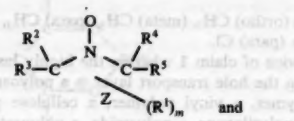
a. a reducing agent which provides a developed image within about 90 seconds at a temperature of about 100° to 250° C. upon heating said element;

b. an organic silver salt oxidizing agent; and

c. a silver halide; and, in the same or a different layer,

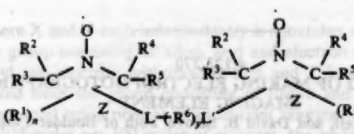
a stable free radical nitroxyl bleaching agent having a formula selected from the group consisting of:

I.



and

II.



wherein Z comprises the nonmetallic atoms necessary to complete a 5 to 7 member heterocyclic ring; *y* is 0 or 1; *m, n* and *p* are independently selected from the group of integers of 1 to 4, R^1 is independently selected from the group consisting of hydrogen, alkyl, amino, aryl, cycloalkyl, hydroxy, hydroxyimino, imino, isothiocyanato, oxo, a 5 to 10 member nonme-

tallic heterocyclic ring, a complexing ligand for silver (I) ion wherein the Ksp of the complexed product of the ligand and silver (I) ion is less than about 10^{-12} at 25° C., and —L—R^9; L and L' are the same or different and are linking groups selected from the group consisting of amino, carbonamido, ureylene, thioureylene, oxymethylenecarbonamido, carbonyloxy, carbonyldioxy, oxycarbonyl, carbonyl, sulfonamido, amidothiocarbonyl, oxymethyleneoxycarbonyl and dicarbonamido; R^9 is selected from the group consisting of hydrogen, alkyl, aryl, alkenyl, aryloxy, hydroxy, amino, a cation of a quaternary ammonium salt and a 5 to 10 member nonmetallic heterocyclic ring; and R^6 is selected from the group consisting of alkylene, cycloalkylene, arylene, a 5 to 7 member bivalent nitrogen-containing heterocycle, and a thio-interrupted alkylene chain; and R^2, R^3, R^4 and R^5 are independently selected from the group consisting of alkyl, cycloalkyl, aralkyl, aryl, or R^2 and R^3 or R^4 and R^5 can be taken together with the carbon atom of the ring to which they are attached to form a cycloalkyl or cycloalkenyl having from 4 to 10 carbon atoms.

4,123,274
HEAT DEVELOPABLE IMAGING MATERIALS AND PROCESS

Phillip D. Knight, Fairport; Richard A. deMauriac, Webster, and Patricia A. Graham, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

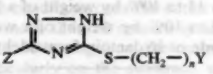
Filed Mar. 16, 1977, Ser. No. 778,183
Int. Cl.² G03C *5/30, 1/02, 1/76, 3/00*
U.S. Cl. 96—66 T **32 Claims**

1. A photothermographic element comprising a support having thereon in reactive association

(a) photosensitive silver halide,

(b) an image-forming combination comprising

(i) a silver salt of a 3-amino-1,2,4-mercaptotriazole represented by the formula:



wherein Y is aryl containing 6 to 12 carbon atoms; n is 0 to 2; and Z is hydrogen, hydroxyl or —NH_2; with

(ii) a silver halide developing agent, and a polymeric binder.

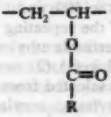
2. A process of developing an image in an exposed photothermographic element as defined in claim 1 comprising heating said element to a temperature within the range of 125° C. to 200° C. until an image is developed.

4,123,275
COLOR DIFFUSION TRANSFER PHOTOGRAPHIC MATERIALS WITH VINYL COPOLYMER NEUTRALIZATION RATE CONTROLLING LAYER

Yukio Karino; Shinji Sakaguchi, and Takashi Yoshida, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Jul. 26, 1976, Ser. No. 708,973
Claims priority, application Japan, Jul. 24, 1975, 50/90616
Int. Cl.² G03C *7/00, 5/54, 1/40*
U.S. Cl. 96—77 **18 Claims**

1. A color diffusion transfer photographic material comprising a photosensitive element including at least one silver halide emulsion layer having associated therewith a dye image providing material, an image receiving element for fixing the diffusible dye formed from said dye image providing material to form a dye image, an alkaline processing composition for developing the exposed photosensitive element, neutralizing means to lower the pH of the processing composition, and, if desired, another hydrophilic layer or layers, said neutralizing means including a neutralization rate controlling layer and said neutralization rate controlling layer containing a copolymer of at least one vinyl compound and at least one unsaturated monomer addition polymerizable with the vinyl compound, said copolymer having the recurring structural unit represented by the general formula:



wherein R represents a hydrogen atom of an aliphatic group having 1 to 4 carbon atoms wherein the proportion of the recurring structural unit ranges from 65 to 95 mol % and at least one of the unsaturated monomer(s) addition polymerizable with the vinyl compound is selected from hydroxyalkyl acrylates, hydroxyalkyl methacrylates, vinyl heterocyclic compounds, acrylamides or methacrylamides, said neutralization rate controlling layer being so configured that a support has coated thereon, in order, as essential layers, one of configurations (1) to (4):

(1) an acid polymer layer, the neutralization rate controlling layer, and an image receiving layer;

(2) an acid polymer layer, the neutralization rate controlling layer, and a photosensitive layer or layers;

(3) an acid polymer layer, the neutralization rate controlling layer, an image receiving layer, a white reflecting layer, and a photosensitive layer or layers; or

(4) an acid polymer layer, and the neutralization rate controlling layer, the neutralization rate controlling layer being disposed so as to be between the acid polymer layer and the alkaline processing composition when the alkaline processing composition is spread for developing the exposed photosensitive element.

4,123,276
PHOTOSENSITIVE COMPOSITION

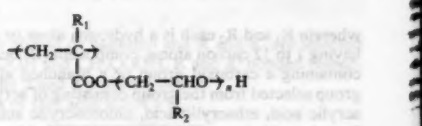
Nobuyuki Kita, and Yasuhisa Narutomi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan and National Patent Development Corporation, New York, N.Y.

Continuation of Ser. No. 551,106, Feb. 20, 1975, abandoned.
This application Jan. 18, 1977, Ser. No. 760,371
Claims priority, application Japan, Feb. 28, 1974, 49-23940
Int. Cl.² G03C *1/52*
U.S. Cl. 96—91 R **21 Claims**

1. A photosensitive composition suitable for use in a planographic printing plate consisting essentially of

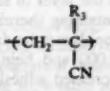
(a) a copolymer in which, on weight basis,

(1) from 30 to 80% of the repeating structural units of said copolymer are represented by the general formula (I)



wherein R_1 is a hydrogen atom or methyl group, R_2 is a hydrogen atom, methyl, ethyl or chloromethyl group and n is an integer of 1 to 10;

(2) from 5 to 60% of the repeating structural units of said copolymer are acrylonitrile units or methacrylonitrile of the units of the formula



wherein R_3 is hydrogen or methyl;

(3) repeating structural units of said copolymer include

alpha, beta ethylenically unsaturated carboxylic acid units or the half ester units of a cycle acid anhydride with I, the amount of (3) being sufficient so that said copolymer has an acid value of 10 to 100; and

(4) from 64 to 0% of the repeating units of said copolymer are addition polymerizable ethylenically unsaturated compound units other than (1), (2), or (3), wherein said unsaturated compound is selected from the group consisting of acrylates, methacrylates, acrylamide, methacrylamide, allyl compounds, vinyl ethers, vinyl esters, styrenes or crotonates;

the viscosity of said copolymer being 1,000 to 20,000 cps as determined for a 33% by weight solution of said copolymer in ethylene glycol monomethyl ether at 25° C by means of a Brookfield rotational viscosimeter, and

(b) a diazonium compound, said copolymer being 50 to 95% by weight of the total weight of (a) and (b),

wherein said photosensitive composition, if unexposed to actinic light, is soluble in a weak aqueous alkaline solution and wherein said photosensitive composition is insoluble in said solution if said photosensitive composition is exposed to actinic light.

6. A composition according to claim 1 in which the content of the copolymer (a) is 60 to 92% by weight and the content of the diazonium compound (b) is 40 to 8% by weight, based on the total weight of components (a) and (b).

4,123,277

COPOLYMER SUBBING MATERIAL FOR PHOTOGRAPHIC ELEMENTS

Takeji Ochiai, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

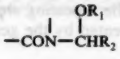
Continuation of Ser. No. 499,360, Aug. 21, 1974, abandoned. This application Mar. 24, 1977, Ser. No. 780,881

Claims priority, application Japan, Aug. 21, 1973, 48/93578

Int. Cl.² G03C *1/86, 1/94, 5/54, 1/78*

U.S. Cl. 96—85 **31 Claims**

1. A photographic element which comprises a resin film or resin coated paper having superimposed thereon a subbing layer of a composition consisting essentially of a copolymer of components (A), (B) and (C), wherein component (A) is present in an amount from about 0.1 to 15% by weight, component (B) is present in an amount of from 0.01 to 5% by weight, and component (C) is present in an amount of from about 20 to 80% by weight, component (A) being a monomer containing therein a moiety of the general formula (I)



(I)

wherein R_1 and R_2 each is a hydrogen atom or an alkyl group having 1 to 12 carbon atoms, component (B) being a monomer containing a carboxyl group or a branched alkoxy carbonyl group selected from the group consisting of acrylic acid, methacrylic acid, ethacrylic acid, chloroacrylic acid, maleic acid, fumaric acid, itaconic acid, mesaconic acid, citraconic acid, sorbic acid, acryloxypropionic acid, itaconic acid anhydride, maleic acid anhydride or a mixture of these acids, and component (C) being at least one monomer selected from the group consisting of isoprene, butadiene, butene, octene, styrene, methylstyrene, methyl vinyl ether, ethyl vinyl ether, chloroethyl vinyl ether, butyl vinyl ether, unsubstituted vinyl esters, acrylates, methacrylates, and acrylonitrile and a hydrophilic colloid layer coated on the layer of said composition comprising said copolymer containing therein the moiety of the general formula (I), said copolymer having a molecular weight of about 10,000 to 1,000,000 and being present in an amount effective to provide increased adhesion, of a degree useful in photographic element, between said resin film or resin coated paper and said hydrophilic colloid layer, and said resin film or resin coated paper having at least one layer containing a light-sensitive silver halide, physical development nuclei as used in a diffusion transfer process or a diazo compound.

4,123,278

POLYESTER FILM COATED WITH ADHESIVE POLYMER COMPOSITION

August J. Van Paesschen, Antwerp, and Lucien J. Van Gossum, Kontich, both of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Mar. 17, 1977, Ser. No. 778,736

Claims priority, application United Kingdom, Mar. 19, 1976, 11216/76

Int. Cl.² G03C *1/80*

U.S. Cl. 96—87 R **18 Claims**

1. A coated film comprising a dimensionally stable polyester film support, said film support having a hydrophilic coating adherent thereto by way of a single intermediate adhesive layer strongly adhering to said film support, said adhesive layer consisting essentially of about 25 to 60% by weight of a chlorine-containing copolymer, about 15 to 40% by weight of a butadiene copolymer, and about 2 to 10% by weight of a water-soluble melamine-formaldehyde or hydantoin-formaldehyde resin and being free of gelatin.

17. A process for preparing coated film comprising a dimensionally stable polyester film support having a hydrophilic coating adherent thereto by way of an adhesive layer strongly adhering to said film support, which comprises applying said adhesive layer to an at most monoaxially stretched polyester film support, stretching the thus covered polyester film support as necessary to impart biaxial stretching thereto, heat-setting the thus treated film at a temperature of 180° to 225° C., and applying a hydrophilic coating to said heat-set adhesive layer, said adhesive layer consisting essentially of a gelatin-free mixture of from 25 to 60% by weight of a chlorine-containing copolymer, from 15 to 40% by weight of a butadiene copolymer, and from 2 to 10% by weight of a water-soluble melamine-formaldehyde or hydantoin-formaldehyde resin.

4,123,279

LIGHT-SENSITIVE O-QUINONEDIAZIDE CONTAINING PLANOGRAPHIC PRINTING PLATE

Kesanao Kobayashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 561,762, Mar. 25, 1975, abandoned. This application Jan. 4, 1977, Ser. No. 756,653

Claims priority, application Japan, Mar. 25, 1974, 49-33264

Int. Cl.² G03C *1/60;* G03F *7/08*

U.S. Cl. 96—91 D **15 Claims**

1. A positive-working light-sensitive planographic printing plate capable of providing a useful print on paper after about 8 to 10 sheets of printing when said plate is coated after development with gum arabic solution of 14° Be, and then stored for about a period of one day, comprising a support having thereon a light-sensitive layer containing in admixture a o-quinonediazide light-sensitive material which becomes alkali solution-soluble upon irradiation with actinic light selected from the group consisting of an ester of an amide compound of o-benzoquinonediazide, o-naphthaquinonediazide, quinolinequinonediazide which comprises adding to the light-sensitive layer

(a) about 15 to 50% by weight of said o-quinonediazide light-sensitive material,

(b) about 1 to 20% by weight of an organic solvent soluble novolak resin produced by the condensation of an aldehyde and tertbutyl phenol, and

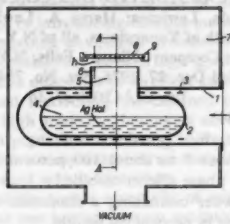
(c) about 40 to 83% by weight of an alkali-solution soluble phenol-formaldehyde resin or an alkali-solution soluble cresol-formaldehyde resin, each percent by weight being based on the weight of said light-sensitive layer, components (a), (b) and (c) being present in said light-sensitive layer in admixture.

4,123,280

SILVER HALIDE VAPOR DEPOSITION METHOD

Yordan P. Malinovski; Borislav D. Mednikarov, and Jakob J. Assa, all of Sofia, Bulgaria, assignors to Zlafop pri BAN, Sofia, Bulgaria

Filed Jun. 12, 1975, Ser. No. 586,429
Claims priority, application Bulgaria, Jun. 14, 1974, 26984
Int. Cl.[2] G03C *1/02;* C23C *13/00;* B05B *13/06;* C03C *5/00*
U.S. Cl. 96—94 BF 35 Claims



1. A method for the production of a photographic material including a silver halide-coated substrate which comprises heating a silver halide having a purity of not less than 99.999% under vacuum conditions in a crucible formed of a material that is inert when heated to an elevated temperature with radiant heating means located around the outside of the crucible to achieve substantially uniform heating of the crucible and its contents to effect thereby a sublimation of the silver halide and the production of a concentrated stream of silver halide vapor issuing from an outlet in the crucible, said radiant heating means being located remote from and out of communication with said vacuum conditions, and passing a substrate under said vacuum conditions over the outlet of the crucible at a distance of not more than 10 mm away so that the vapor stream of silver halide issuing from the outlet of the crucible impinges perpendicularly on the substrate, said silver halide being deposited on the substrate at a rate of 200–2000 A/sec.

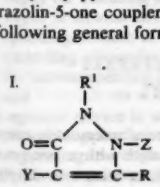
4,123,281

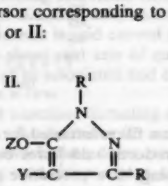
PHOTOGRAPHIC SILVER HALIDE COLOR MATERIAL CONTAINING FAST-ACTING HARDENER AND 2-PYRAZOLIN-5-ONE COUPLER PRECURSORS

Marcel J. Monbaliu, Mortsel, Belgium; Hans-Heinrich Credner, Munich, Fed. Rep. of Germany; Wolfgang Himmelmann, Opladen-Lutzenkirchen, Fed. Rep. of Germany; Ernst Meier, Munich, Fed. Rep. of Germany; Gaston J. Benoy, Edegem; Raphael K. Van Poucke, Berchem, both of Belgium; Karl-Wilhelm Schranz, Odenthal-Hahnenberg, Fed. Rep. of Germany, and George F. Van Veelen, Mortsel, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Aug. 17, 1976, Ser. No. 715,105
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1975, 2539729
Int. Cl.[2] G03C *1/40*
U.S. Cl. 96—100 R 8 Claims

1. Colour photographic silver halide material containing a fast-acting hardener selected from the group consisting of carbodiimides, dihydroquinolines, carbamoyl pyridiniums and carbamoyloxy pyridiniums wherein said material contains a 2-pyrazolin-5-one coupler precursor corresponding to one of the following general formulae I or II:

I. 

II. 

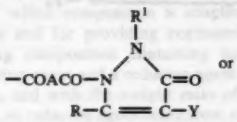
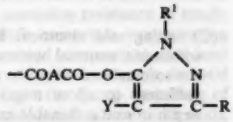
in which

R^1 represents an alkyl group or an aryl group,

R represents an alkyl group, an aryl group, an anilino group, or an acylamino group derived from a carboxylic or sulphonic acid,

Y represents hydrogen, a group that can be split off during the colour development for the formation of colour-forming coloured or colourless 2-pyrazolin-5-one couplers, or a group that cannot be split off for the formation of 2-pyrazolin-5-one competing coupler, and

Z represents an acyl group deriving from an organic carboxylic acid, an alkoxy-carbonyl group, an aryloxycarbonyl group, or the group


or


in which R^1, R, and Y have the above-defined significance, and A represents an alkylene group or an arylene group.

4,123,282

PHOTOTHERMOGRAPHIC TONERS

John M. Winslow, South Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 611,025, Sep. 8, 1975, Pat. No. 3,994,732. This application Aug. 9, 1976, Ser. No. 712,682
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.[2] G03C *1/02, 1/40*
U.S. Cl. 96—114.1 7 Claims

1. In a photosensitive, heat-developable, dry silver sheet material containing an image-forming system including a preformed photosensitive silver halide catalyst-forming means and, as heat sensitive image forming means, an organic silver compound and a reducing agent therefor, the oxidation reduction reaction of which to produce a visible image is accelerated by said catalyst, and sufficient toner to increase the density of said visible image, the improvement characterized by said toner being a mixture of (a) phthalazine and (b) at least one acid of the formula:

$$R - A - R_1$$

wherein A is phenyl or naphthyl and R and R_1 are selected from —COOH and CH_2COOH, R and R^1 bonded respectively to the 2 and 3 positions of A_1

and anhydrides of said acid R - A - R_1.

4,123,283

SETTING ELECTRICAL LATENT IMAGES IN MIGRATION IMAGING ELEMENTS

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

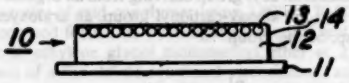
Filed Apr. 9, 1973, Ser. No. 349,506
Int. Cl.[2] G03G *13/22*
U.S. Cl. 96—1 PS 33 Claims

1. An imaging method, comprising:

(A) providing an imaging member comprising a migration layer comprising migration material and substantially electrically insulating softenable material, said softenable material capable of having its resistance to migration of migration material decreased sufficiently to allow migra-

tion of migration material in depth in said softenable material;

(B) providing said imaging member with an electrical latent image; and



(C) setting said electrical latent image by softening said softenable material without decreasing the resistance of the softenable material to migration of migration material sufficient to allow migration of migration material in depth in said softenable material.

4,123,284

POROUS CERAMIC BODIES

Konrad C. Rieger, New Fairfield, Conn., assignor to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed May 6, 1977, Ser. No. 794,425

Int. Cl.[2] C04B *35/14, 35/44*

U.S. Cl. 106—40 R **14 Claims**

1. A method for producing a porous ceramic product having uniform pore distribution comprising the steps of mixing together about 40 to 65 percent by weight water and about 60 to 35 percent by weight of a mineral mixture comprising about 10 to 100 percent by weight pyrophyllite and about 90 to 0 percent by weight clay selected from the group consisting of china clay and ball clay, agitating the resulting mixture to form a self-foaming slurry, curing and subsequently firing.

4,123,285

FOAMED CERAMIC ELEMENT

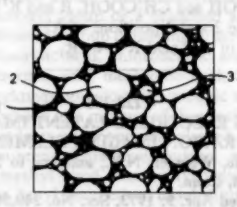
Peter Schuster, Mannheim, Neu-Edingen, and Bernd von Chiari, Rodental, both of Germany, assignors to Schneider GmbH & Co., Frenchen, Germany

Filed Feb. 3, 1977, Ser. No. 765,304

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1976, 2604793

Int. Cl.[2] C04B *21/02*

U.S. Cl. 106—40 R **11 Claims**



1. Foamed ceramic element of lightweight and of uniform construction throughout formed from mineral raw materials comprising a body portion with relatively large, spherical-like closed pores substantially uniformly distributed throughout said portion, a solid portion of web-like construction surrounding said relatively large, spherical-like pores, said solid portion of web-like construction including relatively small pores distributed throughout said solid portion, the ratio of the mean diameter of the larger pores to the mean diameter of the smaller pores ranging from 3:1 to 8:1, said ceramic element having a crystalline phase of at least about 10 percent by weight and further characterized as having a water absorption characteristic nearly zero and a diffusion resistance factor which is practically infinite.

4,123,286

SILICON CARBIDE POWDER COMPOSITIONS

John A. Coppola, Lewiston; Harry A. Lawler, and Carl H. McMurtry, both of Youngstown, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,648

Int. Cl.[2] C01B *31/36*

U.S. Cl. 106—44 **12 Claims**

1. A silicon carbide powder containing:

(a). From about 5 to about 100 percent by weight alpha crystalline phase silicon carbide,

(b). said powder containing a maximum of the following components in percent by weight:

SiO_2	2.00
Free Silicon	0.25
Iron	0.50
Alkali and Alkaline Earth Metals	0.50
Total Metal Oxides	3.75

(c). the particles in said powder having an average particle size from about 0.10 to about 2.50 microns,

(d). said powder characterized by the property of being sinterable under substantially pressureless conditions at a temperature between about 1950° C. and about 2500° C. when mixed with between about 0.05 and about 4.0 percent by weight of combinable carbon and from about 0.03 to about 3.0 percent by weight of a densification aid.

4,123,287

GLASS FIBRES FOR REINFORCEMENT OF CEMENT PRODUCTS

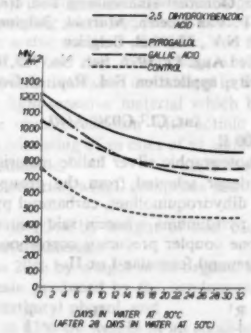
David R. Cockram, Wigan, England, assignor to Pilkington Brothers Limited, Merseyside, England

Filed Jul. 26, 1976, Ser. No. 708,977

Claims priority, application United Kingdom, Jul. 24, 1975, 31016/75

Int. Cl.[2] C04B *7/02*; D02G *3/00*

U.S. Cl. 106—99 **8 Claims**



1. Glass fibres intended for use as reinforcement in cementitious products, said fibres being coated with a composition comprising, as a protective material, at least one dihydroxybenzoic acid.

4,123,288

CALCINATION

James A. Stringer, Barnstone, and David Watson, Waltham on the Wolds, Nr. Melton Mowbray, both of England, assignors to The Associated Portland Cement Manufacturers Limited, England

Filed Oct. 26, 1976, Ser. No. 735,541
Claims priority, application United Kingdom, Oct. 30, 1975, 44954/75; Jan. 13, 1976, 01177/76
Int. Cl.² C04B 7/02
U.S. Cl. 106—100 15 Claims

1. In a method of thermal calcination of minerals which comprises the steps of introducing mineral matter into a calcination system comprising an optimal pretreatment zone and a kiln, introducing combustion air and high grade fuel directly into said kiln in such quantities as to effect calcination of said mineral matter, and recovering the calcined mineral matter from the kiln, the high grade fuel having an ash content which does not exceed a predetermined value and a calorific value sufficient to produce a temperature in excess of 900° C. in said kiln, the improvement which comprises:

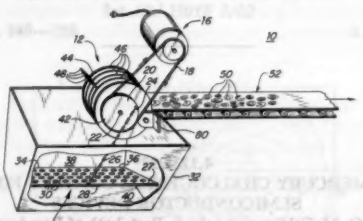
burning combustible matter externally of said kiln and obtaining at least one heated gaseous medium which is at a temperature not greater than about 900° C., and transferring heat from said heated gaseous medium to said calcination system whereby the quantity of said high grade fuel may be reduced, said combustible matter having an ash content significantly higher and a calorific value significantly lower than said high grade fuel.

4,123,289

AUTOMATIC PICK-UP AND RELEASE MECHANISM AND AGITATOR DEVICE

Ronald D. Bourgeois, 38 Ellison Park, Waltham, Mass. 02154

Filed Jul. 5, 1977, Ser. No. 812,616
Int. Cl.² B08B 3/04
U.S. Cl. 134—134 1 Claim



1. An automatic pick-up and release system for handling annular and quasi-annular items presented in a fluid and depositing them on a conveyor comprising:

a fluid container for holding fluid containing said items;

an automatic pick-up and release mechanism including a curved surface fixed with said container and having an axis of curvature; a rotatable shaft having an axis parallel and eccentric to said axis of curvature; at least one pick-up element extending radially from and fixed to rotate with said shaft; each said element extending beyond said curved surface and into said fluid for spearing the items and extending short of said curved surface proximate the conveyor for releasing and depositing said items on the conveyor in an area farther from said shaft axis; a slot, corresponding to each of said elements in said curved surface, extending circumferentially about said axis of curvature for accommodating motion of its associated said element; and

an agitator device in said fluid container including a swash plate; a support structure in said container for swingably supporting one edge of said swash plate; drive means; and link means, interconnecting said drive means and said swash plate for reciprocally rotating said swash plate about its edge supported by said support structure for agitating the fluid and keeping in motion the items to be speared by said elements.

4,123,290

CHROMIUM-CONTAINING COATING OF ENHANCED CORROSION RESISTANCE

Alexander W. Kennedy, Chardon, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio

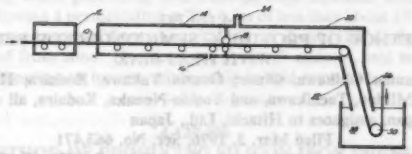
Filed Apr. 21, 1977, Ser. No. 789,405
Int. Cl.² C23F 7/26
U.S. Cl. 148—6.2 10 Claims

1. In a pulverulent-metal-containing aqueous coating composition containing pulverulent zinc, aluminum, or their mixtures, which composition is adapted for treating metal substrates and for providing corrosion resistance thereto, said coating composition containing hexavalent chromium, pH adjusting agent and a reducing agent for said hexavalent chromium, and with the weight ratio of chromium, expressed as CrO_3, to reducing agent being from about 4:1 to about 50:1, the improvement for enhancing the corrosion resistance of resulting coated metal substrates which comprises incorporating 0.1–20 grams per liter of urea into said composition as at least a portion of said reducing agent, and with the proviso that said pH adjusting agent is selected from the group consisting of basic zinc oxides, basic zinc peroxides, zinc salts of weak acids, and mixtures thereof, said agent having sufficient water solubility in said composition to provide for pH adjustment.

4,123,291

METHOD OF TREATING STEEL STRIP AND SHEET SURFACES, IN SULFUR-BEARING ATMOSPHERE, FOR METALLIC COATING

Jerry L. Arnold, Franklin; Frank C. Dunbar, Monroe; Alan F. Gibson, Middletown, and Marvin B. Pierson, Franklin, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

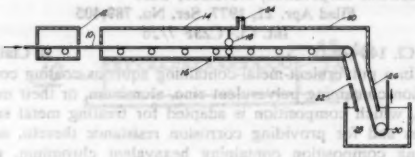
Filed Dec. 23, 1976, Ser. No. 753,622
Int. Cl.² C23C 11/08
U.S. Cl. 148—6.35 9 Claims

1. A method of preparing the sufaces of steel strip and sheet stock for fluxless hot dip coating with molten metal, comprising the steps of passing the stock through a furnace heated by direct combustion with air of gaseous fuel containing sulfur compounds ranging from about 5 to about 1600 grains of sulfur per 100 cubic feet of fuel to produce an atmosphere of gaseous products of combustion containing sulfur and from about 2% free oxygen by volume to about 2% by volume excess combustibles in the form of carbon monoxide and hydrogen in which atmosphere said stock is heated to about 540° to about 705° C., thereby causing the formation of a visible sulfur and oxygen rich layer on the stock surfaces, continuing the heating of said stock in a further heating zone isolated from said furnace in an atmosphere consisting of a gas inert to said sulfur and oxygen rich layer and less than 5% hydrogen by volume, thereby preserving said layer, and cooling said stock approximately to the temperature of the molten coating metal in a cooling zone isolated from said heating zones, said cooling zone containing a reducing atmosphere comprising at least 10% hydrogen by volume, whereby to reduce said sulfur and oxygen rich layer completely to a metallic iron surface wettable by said coating metal.

4,123,292

METHOD OF TREATING STEEL STRIP AND SHEET SURFACES FOR METALLIC COATING

Alan F. Gibson, Middletown, and Marvin B. Pierson, Franklin, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Dec. 23, 1976, Ser. No. 753,623
Int. Cl.[2] C23C *11/08*
U.S. Cl. 148—6.35 7 Claims



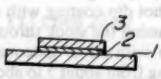
1. A method of preparing the surfaces of steel strip and sheet stock for fluxless hot dip coating with molten metal, comprising the steps of passing the stock through a first heating section containing an atmosphere of gaseous products of combustion having substantially no excess combustibles and from 0% to 2% free oxygen by volume in which atmosphere said stock is heated to a temperature above that at which said stock is oxidized and within the range of about 540° to about 705° C. whereby to form a visible iron oxide layer on the stock surfaces in the color range of dark straw through blue, continuing the heating of said stock without exposure thereof to outside atmosphere in a second heating section isolated from said first heating section in an atmosphere containing less than 5% hydrogen by volume and the balance a gas inert to said oxide layer, thereby preserving said oxide layer, and cooling said stock approximately to the temperature of the molten coating metal in a cooling section isolated from said heating sections, said cooling section containing a reducing atmosphere comprising at least 10% hydrogen by volume, whereby to reduce said iron oxide layer completely to a metallic iron surface wettable by said coating metal.

4,123,293

METHOD OF PROVIDING SEMICONDUCTOR PELLET WITH HEAT SINK

Susumu Okikawa, Ohme; Osamu Yukawa, Kodaira; Hiroshi Mikino, Tachikawa, and Yoshio Nonaka, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 3, 1976, Ser. No. 663,471
Claims priority, application Japan, Mar. 7, 1975, 50-27149
Int. Cl.[2] C22F *1/08*
U.S. Cl. 148—11.5 C 13 Claims



6. A method of providing a silicon semiconductor pellet with a heat sink comprising the steps of:

preparing a heat sink material consisting mainly of copper, said heat sink material containing about 0.10–0.13 weight % of a metal selected from the group consisting of Sn, Fe, Ag, Ni, Zn and P;

rolling said heat sink material;

shaping the rolled heat sink material into a heat sink having desired dimensions;

annealing said heat sink; and

placing said silicon semiconductor pellet over said heat sink with gold foil interposed therebetween and scrubbing them at a temperature for forming a eutectic alloy between said gold foil and said silicon semiconductor pellet.

4,123,294

METHOD OF SEPARATING FERRITIC STEEL OR DUCTILE IRON FROM CERTAIN NONFERROUS METALS

Dean K. Hanink, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1977, Ser. No. 763,301
Int. Cl.[2] C21D *1/44*
U.S. Cl. 148—13.1 3 Claims

1. A method of treating a composite comprising a layered portion of a nonferrous metal taken from the group consisting of silver, silver alloys, gold, gold alloys, copper and copper alloys bonded to a layered portion of iron or low carbon steel wherein the ferrous layer can be through carburized to substantially separate the nonferrous metal from the ferrous metal comprising;

heating the composite material in a carburizing environment at a temperature above the austenitic transformation temperature of said ferrous metal portion until sufficient carbon has diffused into the ferrous metal portion to render it through hardenable,

quenching the composite from a temperature above the austenitic temperature of the carburized ferrous metal portion to a temperature below the transformation temperature of the ferrous metal portion to convert said portion to martensite,

subjecting said composite to a comminuting operation which substantially breaks the hardened ferrous metal portion away from the nonferrous portion reducing the hardened ferrous portion to particles that are smaller in size than comminution products of unhardened nonferrous portion, and

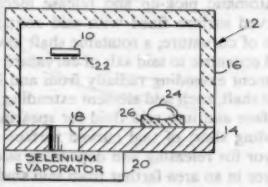
separating the ferrous metal particles from the nonferrous metal comminution products.

4,123,295

MERCURY CHALCOGENIDE CONTACT FOR SEMICONDUCTOR DEVICES

James O. McCaldin, and John S. Best, both of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 14, 1977, Ser. No. 759,350
Int. Cl.[2] H01L *21/363*
U.S. Cl. 148—33 3 Claims



1. In combination with a semiconductor, an improved contact made by stoichiometric deposition of one of the mercury chalcogenides selected from the group consisting of the binary compounds HgSe, HgTe, and β-HgS, or solid solutions of these binary compounds on a semiconductor body to form an abrupt interface and energy gap change between the contact and the semiconductor body.

4,123,296

HIGH STRENGTH STEEL ROD OF LARGE GAUGE

Noboru Yamakoshi, Kobe; Tsugio Kaneda, Akashi; Nobuyasu Hatsuoka, Itami; Shinichi Shimazu; Tatsu Fujita, both of Kobe; Yoshiro Yamada, Akashi; Tetsuo Yamada, and Atsuo Mizuta, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Division of Ser. No. 533,508, Dec. 17, 1974, Pat. No. 4,046,600. This application May 20, 1977, Ser. No. 799,016

Claims priority, application Japan, Dec. 17, 1973, 48/141691; Dec. 17, 1973, 48/141692

The portion of the term of this patent subsequent to Sep. 6, 1994, has been disclaimed.

Int. Cl.[2] C22C *38/18*

U.S. Cl. 148—36 2 Claims

1. A large gauge, high strength steel rod having a diameter of not less than 9 mm prepared by the process which comprises subjecting a high carbon steel rod billet consisting essentially of from 0.65 to 0.9% C, from 0.15 to 1.5% chromium, less than 2.0% silicon, less than 1.5% manganese, at least one element from the group consisting of aluminum, niobium, vanadium zirconium, and titanium in an amount of less than 0.3% in total, balance essentially iron, to hot rolling immediately followed by a controlled cooling treatment, by the use of an air cooling medium, so as to effect a phase transformation to obtain a structure consisting essentially of fine pearlite, wherein said steel rod has a tensile strength of above 115 kg/mm^2, and wherein the reduction in the area of said rod obtained by tensile test is in excess of 35%.

4,123,297

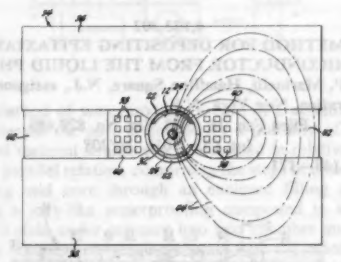
FORMING CURVED THIN MAGNETS FROM RARE EARTH-TRANSITION METAL POWDERS

William F. Jandeska, Rochester; Charles F. Netherton, Marine City, and Charles W. Vigor, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 779,525, Mar. 21, 1977. This application Aug. 1, 1977, Ser. No. 820,600

Int. Cl.[2] H01F *7/02*

U.S. Cl. 148—103 3 Claims



1. A method of making a rare earth-transition metal powder compact having a thin, curved shape, comprising:

compacting a quantity of rare earth-transition metal composition powder in a first press to a pack density of at least 50% of the theoretical density, said powder being substantially magnetically aligned by an applied magnetic field during said compacting, said powder being confined during said compacting in a thin, curved cavity defined between a mandrel shaped to define the inner curved surface of said compact and a die liner shaped to define the outer curved surface of said compact, the compacting force being applied in a direction parallel to the longitudinal axes of said curved inner and outer surfaces,

transporting said powder from said first press to a second press, said powder being held substantially undisturbed in its compacted and magnetically aligned state between said mandrel and liner, said mandrel and liner protecting said powder during the transportation,

thereafter further compacting said powder particles in said cavity in said second press by applying a compacting force in said longitudinal axial direction to a density sufficient to form a relatively strong and self-supporting green compact, said further compacting being accomplished without an applied magnetic field, the magnetic alignment of said powder in said compact not being substantially decreased thereby.

4,123,298

POST DECARBURIZATION ANNEAL FOR CUBE-ON-EDGE ORIENTED SILICON STEEL

Dale M. Kohler, Middletown; Norris A. Dahlstrom, Hamilton, and David W. Taylor, Middletown, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Jan. 14, 1977, Ser. No. 759,326

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—111 3 Claims

1. In a process of producing grain oriented silicon steel chosen from the class consisting of cube-on-edge oriented silicon steel having a permeability at 796 A/m of more than about 1850 and cube-on-edge oriented silicon steel having a permeability at 796 A/m of less than about 1850 and including the steps of hot rolling to hot band thickness, annealing, pickling, cold rolling to final gauge, decarburizing and subjecting the decarburized silicon steel to a final box anneal during which the final desired cube-on-edge orientation is achieved, the improvement comprising the step of subjecting the silicon steel to a continuous high temperature strip anneal after decarburization and prior to said final box anneal, conducting said continuous high temperature strip anneal in an atmosphere chosen from the class consisting of pure nitrogen, pure hydrogen, nitrogenhydrogen combinations, inert gases and decarburizing atmospheres to improve both the permeability and core loss of said silicon steel, conducting said continuous high temperature strip anneal, when producing said cube-on-edge oriented silicon steel having a permeability at 796 A/m of more than about 1850, at a temperature of from about 950° C. to about 1175° C. for a time of from about 15 seconds to about 5 minutes, said time bearing an inverse relationship to said temperature, and conducting said continuous high temperature anneal, when producing said cube-on-edge oriented silicon steel having a permeability at 796 A/m of less than about 1850, at a temperature of from about 925° C. to about 1100° C. for a time of from about 15 seconds to about 10 minutes, said time again bearing an inverse relationship to said temperature.

4,123,299

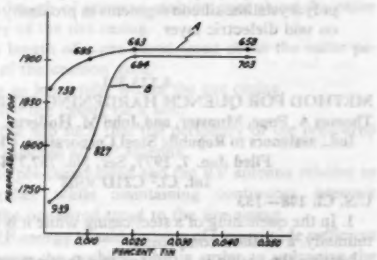
METHOD OF PRODUCING SILICON-IRON SHEET MATERAL, AND PRODUCT

Howard C. Fiedler, Schenectady, N.Y., and Joseph T. Cohen, assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 29, 1978, Ser. No. 837,505

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—111 9 Claims



1. The method of producing grain oriented silicon-iron sheet which comprises the steps of providing a silicon-iron melt

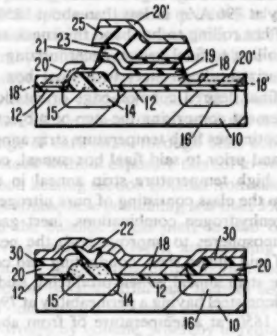
containing 2.2 to 4.5 percent silicon, between about three and 35 parts per million boron, between about 30 and 75 parts per million nitrogen in the ratio to boron of 1 to 15 parts per part of boron, from 0.02 to 0.05 percent manganese, 0.005 to 0.025 percent sulfur and tin in amounts ranging from 0.01 to 0.10 percent, casting the melt and hot rolling the resulting billet to form an elongated sheet-like body, cold rolling the hot rolled body to provide a sheet of final gauge thickness, and subjecting the resulting cold-rolled sheet to a final heat treatment to decarburize it and to develop (110) [001] secondary recrystallization texture in it.

4,123,300

INTEGRATED CIRCUIT PROCESS UTILIZING LIFT-OFF TECHNIQUES

Madhukar L. Joshi; Paul F. Landler, and Ronald Silverman, all of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1977, Ser. No. 793,217
Int. Cl.[2] H01L *29/58, 21/265*
U.S. Cl. 148—187 **15 Claims**



1. A method of making an integrated circuit in a semiconductor comprising the steps of

forming a dielectric layer on the semiconductor surface;

depositing a first layer of polycrystalline silicon on said dielectric layer;

superimposing on said silicon layer a patterned layer of photoresist defining within the edges of said patterned layer of photoresist a protected region of said first layer of polycrystalline silicon;

removing that portion of said first polycrystalline silicon layer without said protected region;

depositing a second layer of polycrystalline silicon over said dielectric layer without the edges of said patterned layer of photoresist and over said patterned photoresist layer;

removing said patterned photoresist layer and that portion of said second layer of polycrystalline silicon deposited over said patterned photoresist layer; and

oxidizing the surfaces of the remaining portions of said first and second polycrystalline silicon layers to form insulated polycrystalline silicon segments in proximity to each other on said dielectric layer.

4,123,301

METHOD FOR QUENCH HARDENING STEEL CASINGS

Thomas A. Pope, Munster, and John M. Holleran, Dyer, both of Ind., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 7, 1977, Ser. No. 757,774
Int. Cl.[2] C21D *9/08*
U.S. Cl. 148—153 **9 Claims**

1. In the quenching of a steel casing while it is moved longitudinally, a method comprising:

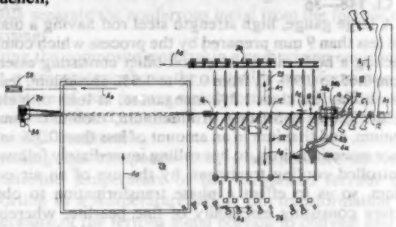
heating the casing in a furnace to a temperature suitable for quenching,

moving the casing from the furnace in a path extending in the longitudinal direction of the casing through an external quench and about an internal quench established through structure at the end of a fluid supply tube longer than the casing,

supporting the supply tube adjacent the external quench to locate the internal quench structure in a position to be received within the casing,

sensing the casing after at least a portion leaves the furnace and in response thereto removing the support after the internal quench structure is received within the casing and before the casing reaches the support,

quenching the casing by directing quenching fluid against internal and external surfaces of the casing as the casing is moved through the external quench and about the internal quench,



initiating removal of the internal quench structure from the moving casing after the casing passes beyond said structure and while still at least partially within the external quench by moving said structure in the same longitudinal direction as the casing but at a substantially faster speed until after it leaves the casing,

then moving the casing transversely out of longitudinal alignment with the internal quench structure,

returning said structure to a position within the external quench, and

again supporting said structure adjacent the external quench in a location to be received within a casing.

4,123,302

METHOD FOR DEPOSITING EPITAXIAL SEMICONDUCTOR FROM THE LIQUID PHASE

Donald P. Marinelli, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,488
Int. Cl.[2] H01L *21/208*
U.S. Cl. 148—171 **7 Claims**

1. A method of depositing an epitaxial layer of a semiconductor material on a substrate comprising the steps of:

(a) bringing the substrate into closely spaced relation to a wafer,

(b) dropping a molten solution of the semiconductor material in a solvent into an edge of the space between the wafer and the substrate so that that solution is sucked up into the space by capillary action and fills the space, and then

(c) cooling said solution so as to precipitate the semiconductor material and deposit the semiconductor material on the substrate.

4,123,303

IGNITABLE COMPOSITIONS

Robert J. Benge, Waltham Abbey, and Cecil H. Miller, Woodford Green, both of England, assignors to Ministry of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 18, 1970, Ser. No. 73,649
Claims priority, application United Kingdom, Sep. 19, 1969, 46393/69
Int. Cl.[2] C06B 45/04
U.S. Cl. 149—17 7 Claims

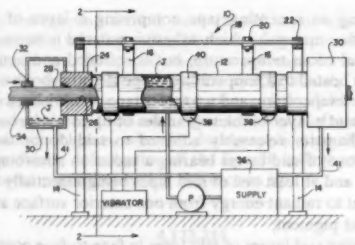
1. A process for the preparation of an explosive delay composition consisting substantially of barium chromate and at least one solid fuel selected from the group consisting of boron, silicon, titanium, tantalum, niobium, antimony and zirconium, comprising suspending the solid fuel in finely divided form in an aqueous medium and reacting in the aqueous medium at elevated temperature a water-soluble chromate with a water-soluble barium compound to thereby precipitate the fuel particles by substantial incorporation of the particles in insoluble barium chromate.

4,123,304

JELLY TUBE CONSTRUCTION AND METHOD OF WATERPROOFING CABLE

Norman O. Gaudette, 221 Partition St., Warwick, R.I. 02888

Filed Dec. 27, 1976, Ser. No. 754,825
Int. Cl.[2] H01B 13/00
U.S. Cl. 156—48 7 Claims



1. A method of waterproofing a core of a communication cable, wherein the core is defined by a plurality of bundled individual material strands that are located in relatively close adjacent parallel relation, comprising the steps of continuously advancing said core through an enclosed filling chamber, directing a jelly-like waterproofing compound in at least a semi-fluid state under pressure into said chamber and in substantially complete enveloping contact with the outer surfaces of said continuously advancing core, and directly vibrating said compound by vibrating means located within said chamber in contact with said compound while maintaining said strands in the relatively close, adjacent parallel relation, wherein said compound is forced between said strands to fill the interstices therebetween, thereby completely waterproofing said strands.

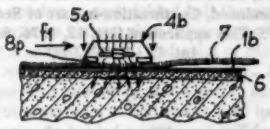
4,123,305

METHOD OF HEATING FOR CONNECTING A PLATE ELEMENT TO A SUPPORT BY MEANS OF A THERMOFUSIBLE GLUE

Thaddée Krzeszowski, Lesigny, France, assignor to Societe Anonyme dite: Weber et Broutin, Seine et Marne, France

Filed Apr. 20, 1977, Ser. No. 789,441
Claims priority, application France, Apr. 21, 1976, 76 11750
Int. Cl.[2] B23K 13/02; H05B 5/00; E04B 2/00; B29C 19/02
U.S. Cl. 156—71 10 Claims

1. A method of fixing a covering sheet to a surface of a support having a surface area at least as large as the covering sheet, comprising spreading over an entire area of the surface of said support substantially equal to the area of the covering sheet a layer including hot melt glue and a material capable of being heated in response to an induction field of vibrations, arranging the covering sheet on the layer so as to sandwich the



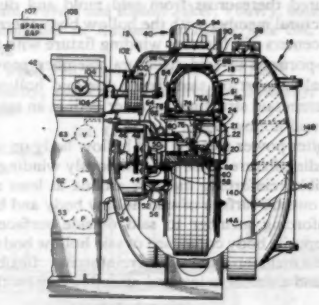
layer between the support and the covering sheet, generating through the covering sheet an induction field of vibrations having an area of at least one square decimeter and substantially less than the area of the covering sheet, and displacing said field over the entire covering sheet to cause the entire covering sheet to be evenly glued to the support.

4,123,306

METHOD AND SYSTEM FOR RETREADING TIRES UTILIZING RF ENERGY

Robert G. Landry, Lewiston, Me., assignor to Long Mile Rubber Company, Dallas, Tex.

Filed Dec. 29, 1976, Ser. No. 755,484
Int. Cl.[2] B29H 5/04, 17/36
U.S. Cl. 156—96 47 Claims



47. A method of retreading tires comprising:
removing an old tread from a tire casing,
applying a length of uncured cushion gum about the outer periphery of the tire casing,
applying a length of a pre-cured tread about the outer periphery of the cushion gum,
positioning an inner tube within the tire casing,
mounting the tire casing on a hub,
mounting the hub such that the periphery of the pre-cured tread is adjacent an RF antenna,
rotating the pre-cured tread and the RF antenna relative to one another while maintaining continuous pressure against the pre-cured tread to the tire casing,
applying RF energy to said antenna of a magnitude sufficient to vulcanize the cushion gum in order to vulcanize the pre-cured tire tread to the tire casing, and
providing an RF energy path from the tire casing to circuit ground.

4,123,307

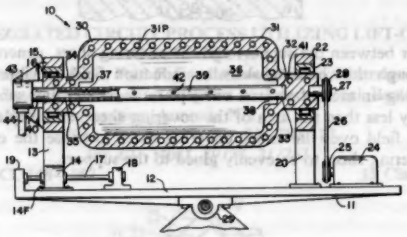
METHOD FOR FORMING HOLLOW SHELLS BY ROTATIONAL CASTING AND WINDING THEREON

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 547,621, Feb. 6, 1975, Pat. No. 4,043,721, Continuation of Ser. No. 300,248, Oct. 24, 1972, Pat. No. 3,875,275, which is a continuation of Ser. No. 744,048, Jul. 1, 1968, abandoned, Continuation-in-part of Ser. No. 612,719, Sep. 12, 1975. This application Oct. 12, 1976, Ser. No. 731,799

Int. Cl.[2] B29C *2/00*

U.S. Cl. 156—172 10 Claims



1. A method of forming a composite article comprising the steps of:

forming a hollow preform by disposing a structural member across a cavity of a mold, introducing a molding material into said mold cavity and causing said molding material to form a hollow body wherein the opposite end portions of said structural member are integrally secured to respective opposite wall portions of said hollow body during the molding procedure by the solidification of said molding material against said structural member and wherein said opposite end-portions of said structural member are accessible to the exterior of said hollow body,

removing said hollow body with said structural member secured thereacross from said mold and disposing said structural member with the hollow body thereon between the centers of a filament winding fixture with the opposite end-portions of said structural member providing rotational support on said fixture for said hollow body and wherein said structural member defines an axis of rotation for said hollow body,

thereafter power rotating said hollow body on said filament winding fixture while simultaneously winding at least one flexible reinforcing member around at least a portion of the outside surface of said hollow body and bonding said reinforcing member to said outside surface to form a composite body composed of said hollow body, said structural member, and said reinforcing flexible member wound thereon in integral assembly therewith.

4,123,308

PROCESS FOR CHEMICALLY BONDING A POLY-P-XYLYLENE TO A THERMOSETTING RESIN AND ARTICLE PRODUCED THEREBY

Thomas E. Nowlin, Somerset, and Ronald A. Martineau, Irvington, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 19, 1977, Ser. No. 843,653

Int. Cl.[2] C08F *8/00, 2/46;* B05D *3/06*

U.S. Cl. 156—272 19 Claims

1. A process for chemically bonding a thermosetting resin to a poly-p-xylylene substrate comprising:

(a) providing a cold plasma within a confined region evacuated to a pressure lower than about 100 torr;

(b) exposing at least one surface of said substrate directly to said plasma within said region for a time period sufficient to form, at the surface of the substrate, functional groups containing oxygen and active hydrogen atoms;

(c) depositing an uncured liquid thermosetting resin capable of reacting with said active hydrogen atoms on said surface; and

(d) curing said resin on said substrate for a time period sufficient to set the resin and chemically bond said surface to the resin in situ via said functional groups.

4,123,309

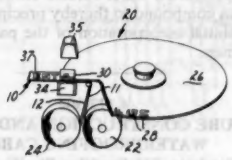
TRANSFER LETTER SYSTEM

Kenneth J. Perrington, New Brighton; Phillip A. Taylor, Lake Elmo, and Peter J. Vogelgesang, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 318,257, Dec. 26, 1976, abandoned. This application Nov. 29, 1973, Ser. No. 420,310

Int. Cl.[2] G03C *5/16;* B41B *13/00*

U.S. Cl. 156—234 4 Claims



1. A method of composing a series of graphics such as letters, numbers, symbols or pictures comprising the sequential steps of:

providing an accepting tape comprising a layer of latent adhesive material, which adhesive material is nontacky at normal room temperature, but is softened and activated when heated to a temperature range slightly above normal room temperature; and a transfer tape comprising a donor web and a layer of microgranules of up to 5 micron average diameter releasably adhered to said donor web, at least one of said layers bearing a radiation absorbing pigment and at least one of said tapes being essentially transparent to radiant energy from one exterior surface at least to said pigment;

positioning said layers of said tapes in face-to-face contact to provide a composite strip material;

briefly and sequentially directing radiation toward successive areas on said exterior surface of the composite strip material, said radiation having sufficient energy to heat said radiation absorbing pigment above the softening range of said adhesive material, while reflectively masking said directed radiation except in successive graphic patterns so that the layer of adhesive material softens selectively in the successive graphic patterns and adheres to the layer of microgranules to provide a series of visible graphic patterns corresponding to the pattern of radiation; and

separating the accepting tape and donor web to transfer microgranules to the accepting tape in the configuration of the visible graphic patterns.

4,123,310

APPARATUS FOR APPLYING A LABEL TO AN OBJECT

Miquel A. Varon, Upland, and Paul F. Paddock, Riverside, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.

Filed Mar. 10, 1977, Ser. No. 776,319

Int. Cl.[2] B65C *3/00*

U.S. Cl. 156—351 28 Claims

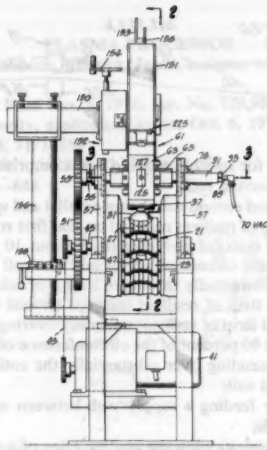
1. Apparatus for successively applying labels respectively to a plurality of objects, comprising:

(a) a mechanism including a label carrier tape for successively delivering a plurality of detached labels at spaced

intervals to a labeling station, each of said labels having an adherent surface and a non-adherent surface;

(b) conveyor means for successively moving a plurality of objects at spaced intervals to said labeling station in synchronism with the delivery of said labels; and

(c) label transfer means at said labeling station for successively transferring the delivered detached labels and applying them to the objects as they are successively moved



to the labeling station, said transfer means comprising a rotatable wheel peripherally mounting a plurality of circumferentially spaced suction cups each having a relatively thin peripheral lip, for synchronously releasably gripping the non-adherent surfaces of the delivered labels and applying them with their adherent surfaces engaged with the objects, whereby during application of a label to an object, deformation of the lip will relieve any suction forces remaining within the suction lip.

4,123,311

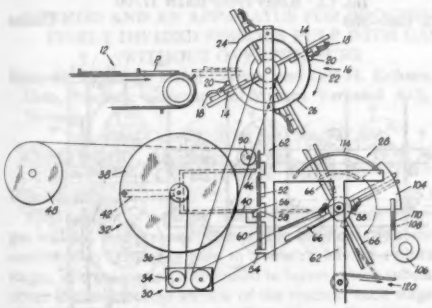
MACHINE FOR WRAPPING BATTERY PLATES

Charles H. McAlpine, Coloma, Mich., assignor to Mac Engineering & Equipment Company, Inc., Benton Harbor, Mich.

Continuation of Ser. No. 543,518, Jan. 23, 1975, abandoned. This application Feb. 12, 1976, Ser. No. 657,693

Int. Cl.[2] B32B *31/20*

U.S. Cl. 156—443 **2 Claims**



1. Battery plate wrapping apparatus comprising

a wrapping and sealing wheel having radially disposed pairs of opposed plates having suction surfaces,

one plate of each pair being swingable toward and away from the other,

means for advancing said wheel in a step-by-step motion to four consecutive stations,

means for inserting a folded wrapper sheet between the plates of said pairs of plates with the folded edge of the sheet inwardly and centered axially of the wheel at a first receiving station,

each side of the folded sheet having a single spaced pair of registering notches in each folded half thereof,

means for inserting a battery plate between the folds of said wrapper at a second station, said pairs of plates being in upwardly opening position at this station,

means responsive to rotation of said wheel to admit vacuum to said vacuum surfaces of said plates from in advance of said first station to behind said second station,

pairs of segmental arcuate rails arranged around each end of a sector of said wheel extending from the exit of said first station to a third station

said rails having edges converging axially of said wheel to enter into the notches in said wrapper and center said battery plate between the side edges of said wrapper,

the side edges of said pairs of plates having notches formed therein clearing said rails,

means for heating said wrapper at said third station,

cam means responsive to rotation of said wheel past said third station to close the plates of said pairs of plates into gripping and retaining engagement with the wrapper and battery plate enclosed therein,

means for sealing the projecting edges of said wrapper sheets,

said sealing means being actuated by the closing of said plates,

and cam means responsive to rotation of said wheel to open said pairs of plates and release said wrapper plates at a fourth station.

4,123,312

APPARATUS FOR PRODUCING COLLAPSIBLE CONTAINERS

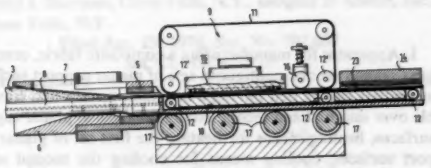
Günter Schmid, Vevey, and Rudolf Jeker, Vouvry, both of Switzerland, assignors to Automation Industrielle SA, Vouvry, Switzerland

Filed Feb. 24, 1977, Ser. No. 771,627

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2643089

Int. Cl.[2] B65C *3/12*

U.S. Cl. 156—466 **8 Claims**



1. Apparatus for forming containers having a deformable tubular body and a closing cap attached to one end of said tubular body which comprises:

a. feeding means for feeding a strip of deformable material through a two step shaping means comprising a shaping tube and a mandrel axially positioned partially within said tube to shape said material into a cylinder having overlapping edges, at least a portion of said shaping tube upstream of a welding means being closed in the peripheral direction, said feeding means including a first endless belt positioned within said mandrel and a second endless driven belt positioned exterior of said mandrel,

b. means for moving said first and second endless belt to frictionally contact and move said shaped material along said mandrel said shaped material and first endless belt being moved solely by said second belt and friction from

said second belt to said first belt via said material said second belt being the sole means for moving said shaped material in said feeding means,

c. said welding means comprising high frequency induction means or ultrasonic means adjacent said mandrel adapted to heat said overlapping edges while moving said material along said mandrel,

d. pressing means adjacent said welding means adapted to press the flowing or liquid heated phase of said shaped material to seal the edges of the shaped material internally and externally,

e. cooling means adjacent said pressing means to set said flowing or liquid phase,

f. cutting means comprising two mating rotated knives adjacent and downstream of said mandrel adapted to segment said closed cylinder into cylindrical tubes of desired length, and

g. means adjacent said cutting means for welding a tube head to one end of each of said cylindrical tubes comprising a high frequency induction means or an ultrasonic means utilized to weld overlapping portions of said tube and said head.

4,123,313

APPARATUS FOR MAKING A COMPOSITE FABRIC

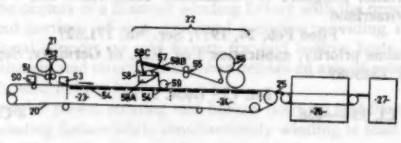
David S. Queen, Sanquhar; Peter W. Bell, Beith; Thomas H. Dick, Dundee, and John B. Edgar, Giffnock, all of England, assignors to Sidlaw Industries Limited, London, England

Continuation of Ser. No. 631,917, Nov. 14, 1975, abandoned, which is a division of Ser. No. 439,931, Feb. 5, 1974, Pat. No. 3,953,269. This application Oct. 5, 1977, Ser. No. 839,566

Claims priority, application United Kingdom, Feb. 19, 1973, 6997/73

Int. Cl.² B32B *3/26*

U.S. Cl. 156—498 **5 Claims**



1. Apparatus for manufacturing a composite fabric, comprising first and second contiguous sets of planar support surfaces, an endless carrier belt having a non-stick surface and traversible over said first and second contiguous sets of planar support surfaces, heating means for heating the first set of planar support surfaces, cooling means for cooling the second set of planar support surfaces, first means for supplying a relatively thick substrate to said carrier belt in advance of said first set of planar support surfaces, said first means including a device for applying deaerated thermo-plastics material in liquid form directly to the surface of said carrier belt, second means for supplying pile-forming material, third means arranged to receive said pile-forming material from said second means, said third means including a lick roller for coating one surface of said pile-forming material with plastics material in liquid form, and fourth means including a roller cooperating with one of said planar support surfaces of said first set substantially immediately adjacent the junction between said first and second sets of planar support surfaces for applying said coated surface of the pile-forming material under heat to said substrate material, whereby said coating on said pile-forming material is briefly heated and gelled and immediately thereafter said composite fabric is cooled.

4,123,314

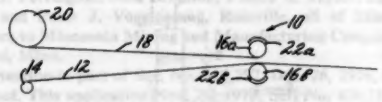
APPARATUS AND METHOD FOR JOINING WEBS ON THE FLY

George H. Sundin, Hermantown, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Filed Aug. 19, 1977, Ser. No. 826,173

Int. Cl.² B31F *5/00*; B65H *19/14*

U.S. Cl. 156—505 **7 Claims**



1. Apparatus for splicing moving web comprising:

(a) first and second rolls;

(b) said first and second rolls being parallel and spaced apart;

(c) a first strip of resilient material on said first roll, said strip of resilient material covering from about 10 to about 80 percent of the circumference of said first roll and extending over substantially the entire length of said first roll;

(d) a second strip of resilient material on said second roll, said second strip of resilient material covering from about 10 to about 80 percent of the circumference of said second roll and extending over substantially the entire length of said second roll;

(e) means for feeding a supply web between said first and second rolls;

(f) means for positioning the leading edge of a reserve web between said rolls;

(g) said first and second rolls being normally stationary and being adapted when actuated to simultaneous rotation through a turn at a peripheral velocity substantially equal to the linear speed of the web; and

(h) said first and second strips of resilient material being out of contact in the stationary position of the first and second rolls and applying opposing force to each other during rotation.

4,123,315

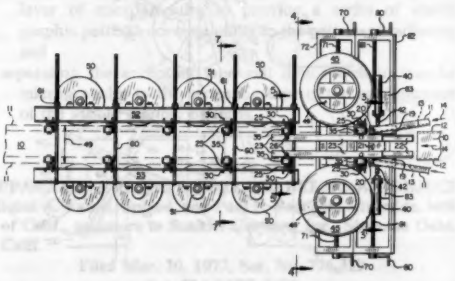
MACHINE FOR ASSEMBLING WOOD I-BEAMS

James R. Keller, Tualatin, and William A. Nickerson, Portland, both of Oreg., assignors to Wm. A. Nickerson & Co., Ltd., Tualatin, Oreg.

Continuation-in-part of Ser. No. 743,532, Nov. 5, 1976, Pat. No. 4,074,498, which is a continuation-in-part of Ser. No. 558,350, Mar. 14, 1975, Pat. No. 3,991,535. This application Jun. 23, 1977, Ser. No. 809,176

Int. Cl.² B26D *1/10*; B32B *31/00*

U.S. Cl. 156—560 **9 Claims**



1. A machine for assembling a pair of grooved wood chord members on opposite side edges of a tongued web member to make an I-beam, said machine comprising means for supporting said web and chord members with tongues on said opposite side edges of said web member in positions to enter grooves in

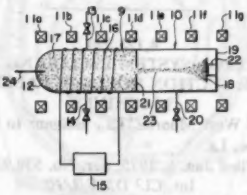
opposed face sides of said chord members, a pair of resilient drive wheels engageable with the opposite sides of said chord members to press said chord members onto said tongues and cause said tongues to enter part way into said grooves, and idle sizing rollers engagable with said opposite sides of said chord members to cause said tongues to enter farther into said grooves to produce a beam of predetermined width measured between said opposite sides of said chord members.

4,123,316

PLASMA PROCESSOR

Takashi Tsuchimoto, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 6, 1976, Ser. No. 729,987
Claims priority, application Japan, Oct. 6, 1975, 50/119769; Feb. 16, 1976, 51/14854
Int. Cl.² B01K *1/00*
U.S. Cl. 156—643 **27 Claims**



1. A plasma processor comprising a plasma generating chamber having a plasma outflow port, means for introducing a gas into said plasma generating chamber, means for ionizing said gas in said plasma generating chamber to form a plasma, a plasma processing chamber disposed in communication with said plasma outflow port and which receives therein at a predetermined location a member to be processed, means for generating coaxial magnetic fields at least between said plasma outflow port and said member located in said plasma processing chamber for confining the plasma effused from said outflow port within a volume defined by said coaxial magnetic fields and for transporting said confined plasma from said plasma outflow port to said member to be processed in said plasma processing chamber, and means for evacuating said plasma processing chamber such that the distance between said plasma outflow port and said member to be processed in said plasma processing chamber is less than the length of the mean free path of any gas remaining in said plasma processing chamber.

4,123,317

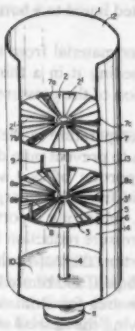
METHOD AND AN APPARATUS FOR PROCESSING FINELY DIVIDED FIBROUS PULP WITH GAS WITHOUT OVERPRESSURE

Bjørn H. Fritzvold; Helge Carling, and Leif H. Eriksen, all of Oslo, Norway, assignors to Myrens Verksted A/S, Oslo, Norway

Filed Oct. 29, 1976, Ser. No. 737,033
Claims priority, application Norway, Oct. 31, 1975, 3661/75
Int. Cl.² D21C *3/24, 7/00, 9/10*
U.S. Cl. 162—17 **25 Claims**

1. A method of treating finely divided fibrous pulp with a gas without overpressure, comprising the steps of substantially continuously supplying pulp to a reactor having a plurality of stages, said pulp being distributed in layers which substantially cover the entire cross-section of the reactor, each stage being divided by a surface having sufficiently small radially extending apertures evenly distributed across the entire cross-section of the reactor for the pulp to form bridges temporarily supporting each layer in turn, the pulp being conveyed from stage to stage by gravity; continuously flowing the gas through all of the apertures and through the temporarily supported pulp over the entire cross-section of the reactor; and breaking the pulp bridges at periodic time intervals thereby advancing the pulp downwards through the apertures from one stage to another for merging with a subjacent layer or to be removed from the reactor as a processed pulp.

13. Apparatus for treating finely divided fibrous pulp, with gas without overpressure, comprising a reactor having an inlet for distributing a suitable layer of pulp, inlet means for fresh gas and outlet means for used gas, a rotatable central shaft having an axis, one or more subjacent substantially stationary supporting means, each extending across substantially the total cross-section of the reactor and each serving temporarily to collect the distributed pulp in a layer, each supporting means



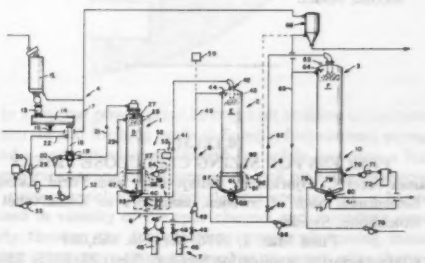
being provided with generally radially extending apertures evenly distributed across the total surface of the supporting means and having a shape and size allowing the finely divided pulp to form bridges across the apertures, said apertures allowing the gas to flow continuously through the pulp, and movable breaking means associated with each supporting means and advanced by driving means along the upper side of the supporting means in the area of the pulp bridges to break these bridges so that the pulp under the influence of gravity is advanced downwards in the reactor to merge with a subjacent layer or to be removed from the reactor as finished processed pulp.

4,123,318

THREE-VESSEL TREATMENT SYSTEM

Michael I. Sherman, Glens Falls, N.Y., assignor to Kamyr, Inc., Glens Falls, N.Y.

Filed Jun. 29, 1976, Ser. No. 701,037
Int. Cl.² D21C *7/10*
U.S. Cl. 162—19 **4 Claims**



1. A method of treating cellulosic fiber material utilizing a first vessel, s separate second, digesting vessel, and a separate third vessel, said method comprising the steps of continuously

(a) feeding cellulosic fiber material entrained in treatment liquid into a top portion of the first vessel,

(b) establishing a first flow path of cellulosic fiber material

entrained in and impregnated with treatment liquid from a bottom portion of the first vessel to a top portion of the second vessel, liquid substantially filling the second vessel,
(c) establishing a column of fiber material in the second vessel below the level of liquid in the second vessel,
(d) withdrawing liquid from a top portion of the second vessel,
(e) establishing a second flow path of the liquid withdrawn from the second vessel back toward a bottom portion of the first vessel,
(f) heating the liquid during transport said second flow path,
(g) feeding a portion of the heated liquid flowing in the second flow path into said first flow path, while feeding the rest of the heated liquid to a bottom portion of the first vessel,
(h) withdrawing fiber material from the bottom of the second vessel and feeding it in a third flow path, without significant reduction of the pressure thereof, to the top of the third vessel,
(i) maintaining the temperature in the bottom of the second vessel low enough to prevent pulp degradation by providing an enlarged portion of said second vessel bottom, withdrawing liquid from the enlarged bottom portion of the second vessel, subjecting a portion of the withdrawn liquid to a large pressure reduction in a pressure reduction area so that a portion thereof flashes into steam and the rest remaining as liquid, and removing this liquid from the pressure reduction area for ultimate recovery or disposal thereof and removing the flashed steam from the pressure reduction area for ultimate reuse thereof,
(j) effecting countercurrent washing of the fiber material in the third vessel,
(k) withdrawing washed pulp from the bottom of the third vessel,
(l) withdrawing liquid from the top portion of the third vessel,
(m) subjecting a portion of the withdrawn liquid to a large pressure reduction in a pressure reduction area so that a portion thereof flashes into steam and the rest remaining as liquid,
(n) removing this liquid from the pressure reduction area for ultimate recovery or disposal thereof and removing the flashed steam from the pressure reduction area,
(o) establishing a fourth flow path of a portion of the liquid withdrawn from the third vessel and not fed to the pressure reduction area from the third vessel and back toward a bottom portion of the second vessel, and
(p) feeding a portion of the liquid flowing in said fourth flow path into the third flow path while feeding the rest of the liquid in the fourth flow path to a bottom portion of the second vessel.

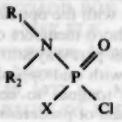
4,123,319

PROCESS FOR SIZING CELLULOSE FIBERS

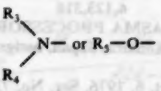
James Axel C. Bjorklund, Saltsjo-Boo, and Turid Ekengren, Sollentuna, both of Sweden, assignors to KemaNobel AB, Stockholm, Sweden

Filed Mar. 1, 1976, Ser. No. 663,001
Claims priority, application Sweden, Mar. 20, 1975, 7503208
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—158 **6 Claims**

1. A process for sizing cellulose fibers or cellulose fiber containing materials wherein cellulose fibers in aqueous suspension or in paper products are reacted with at least 0.001 percent by weight based on dry fibers of a sizing agent, said sizing agent being a compound having the general formula



where X is the group



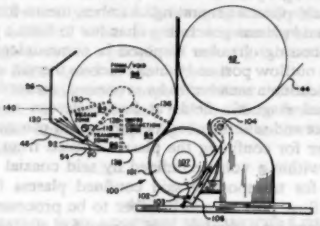
wherein R_1 is an organic, hydrophobic group having from 8 to 40 carbon atoms and R_2, R_3, R_4 and R_5 independent of each other are alkyl groups having 1 to 7 carbon atoms or have the same meaning as R_1.

4,123,320

WATER CONTROL SYSTEM INCLUDING A PRESSURE ROLL FOR SUCTION ROLLS IN PAPERMAKING MACHINES

Fred T. Stone, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Jan. 6, 1975, Ser. No. 538,933
Int. Cl.[2] D21F *3/10*
U.S. Cl. 162—199 **18 Claims**



16. In a papermaking process of the type wherein water is removed from paper that is being run over a suction roll, such as for example a couch roll, the improvement comprising the following steps:
(a) providing a suction roll with a vacuum means for removing water;
(b) providing a wire mesh surface tension covering covering at least a portion of the suction roll, said wire mesh surface tension covering allowing a film-forming action to take place between it and the water from a wet paper web;
(c) providing a pressure roll in face-to-face, pressure engagement with the exterior surface of the suction roll, said pressure roll serving as a means to counteract the tendency of the fines and other substances from the paper from plugging up said wire mesh surface tension covering.

4,123,321

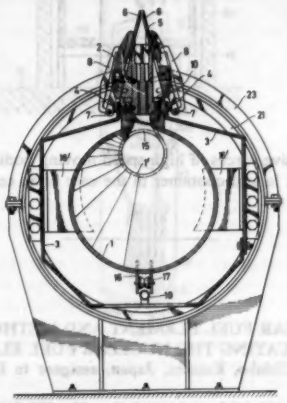
REMOVABLE HEAD BOX FOR A PAPER MAKING MACHINE

Christoph Link, and Robert Trondle, both of Ravensburg, Germany, assignors to Escher Wyss GmbH, Ravensburg, Germany

Filed Jun. 29, 1977, Ser. No. 810,939
Claims priority, application Switzerland, Jul. 6, 1976, 8624/76
Int. Cl.[2] D21F *1/02*
U.S. Cl. 162—272 **9 Claims**

1. A head box for a paper making machine comprising

a distribution pipe of narrowing cross-section in the direction of a flow of pulp therethrough;
a pulp guide connected to said pipe for uniformly distributing the flow of pulp from said pipe onto a permeable element to form a non-woven web;
a box-shaped support having a constant cross-section along a longitudinal axis thereof, said support having said pipe and said pulp guide housed therein;
a pair of annular bearings, each said annular bearing being secured to a respective end of said support; and
a pair of bearing housings, each said housing having a respective annular bearing rotatably mounted therein for



rotation of said support with said pipe and pulp guide therein.

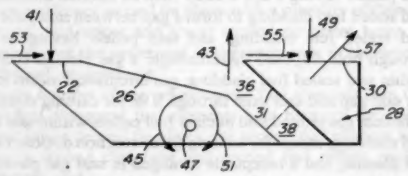
8. A head box for a paper making machine comprising
a distribution pipe of narrowing cross-section in the direction of a flow of pulp therethrough;
a pulp guide connected to said pipe for uniformly distributing the flow of pulp from said pipe onto a permeable element to form a non-woven web;
a box-shaped support having a constant cross-section along a longitudinal axis thereof, said support having said pipe and said pulp guide housed therein; and
means for movably mounting said pipe in said support along said axis.

4,123,322

DRAINAGE FOIL ELEMENT HAVING TWO WIRE BEARING PORTIONS

David P. Hoult, Wellesley, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jun. 24, 1977, Ser. No. 809,909
Int. Cl.² D21F *1/48*
U.S. Cl. 162—352 **5 Claims**



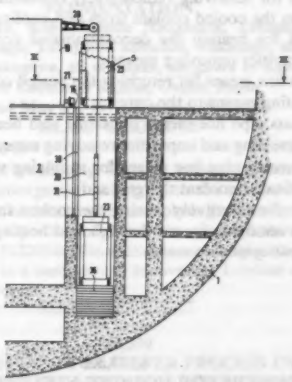
1. A drainage foil element for removable attachment to a web-forming machine having a forming wire and support means for said element extending transversely of said forming wire for supporting said foil element in working relation to said forming wire, said foil element comprising in a unitary structure: a part for confronting said forming wire in use, said part having a first forming wore bearing portion, a suction-creating portion trailing said first bearing portion, a second forming wire bearing portion affixed to and trailing said suction-creating portion, and drainage means between said suction-creating portion and said second bearing portion, whereby during use of said foil element the suction force created by said suction-creating portion is located between a pair of bearing forces imposed by said forming wire on said respective wire bearing portions and located in a part of said element that in use is remote from said forming wire; and mounting means extending lengthwise of said foil for fixing said foil element to said support means, said mounting means being located in said foil element between said wire bearing portions so that the respective torques around said support means produced by said bearing forces are in opposite directions.

4,123,323

NUCLEAR REACTOR PLANT

Robert Weber, Uttenreuth; Erich Katscher, Marloffstein, and Hans-Peter Schabert, Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Jun. 22, 1976, Ser. No. 698,510
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1975, 2528825
Int. Cl.² G21C *19/00*
U.S. Cl. 176—30 **6 Claims**



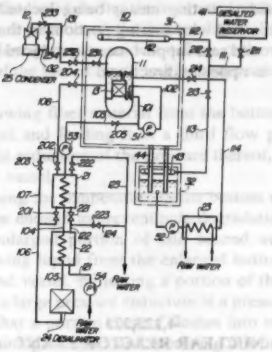
1. In a nuclear power plant having a pit building constructed of concrete and forming walls defining a fuel-element storage pit and a cask pit adjacent thereto for safely lowering a fuel-element transporting cask therein, the cask pit being connected by a spur channel to the fuel-element storage pit, a barrier disposed in vicinity of the spur channel and extending transversely thereto, the fuel-element storage pit having means defining a transport plane disposed at an upper edge thereof, said barrier extending upwardly from said transport plane and having a height equal to at least one-half the vertical length of the fuel-element transporting cask, said barrier being formed with a gap located above said spur channel through which fuel-elements are transportable between the fuel-element storage pit and the cask pit, said gap being narrower than the transporting cask.

4,123,324

APPARATUS FOR DECONTAMINATING A RADIOACTIVELY CONTAMINATED COOLANT

Takahiro Sanada, and Kanehiro Ochiai, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 25, 1977, Ser. No. 762,265
Claims priority, application Japan, Feb. 2, 1976, 51/9323
Int. Cl.[2] G21C *19/30*
U.S. Cl. 176—37 13 Claims



1. An apparatus for decontaminating a coolant for a nuclear reactor having a core of the type which is cooled by the coolant containing radioactively contaminated impurities, the coolant being in a condition in which it is heated by decay heat in the core, comprising, in combination:

means for withdrawing the coolant from the core;

means for cooling the coolant withdrawn from the core by said withdrawing means;

means for removing radioactively contaminated impurities from the cooled coolant from said cooling means;

means for heating the decontaminated coolant from said impurities removing means;

a pipe line means for returning the heated coolant from said heating means to the core;

a bypass pipe line means bypassing said heating means and connecting said impurities removing means to said coolant returning pipe line means for supplying unheated decontaminated coolant thereto; and

means for selectively passing the coolant from said impurities removing means through said heating means or said bypass pipe line means.

4,123,325

CONTAINERS FOR HOUSING NUCLEAR REACTORS

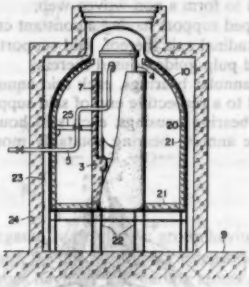
Tadaharu Ichiki, Tokyo; Eiji Shiho, Machida, and Koji Kitagawa, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 2, 1976, Ser. No. 654,175
Claims priority, application Japan, Feb. 5, 1975, 50-15942
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 6 Claims

1. In a pressure tight steel container for housing a rigidly supported pressure vessel containing a nuclear reactor of the type wherein said container comprises a bottom wall and a substantially cylindrical side wall which is surrounded by a biological shield wall spaced from said container side wall, the improvement which comprises:

a relatively flexible metal framework supporting structure for supporting the bottom wall of said container, and

a protective wall provided along substantially the entire inner surface of said container and supported by the bottom wall thereof for receiving the jet stream and the



percussive forces of high speed moving bodies which are created in said container in the case of an emergency.

4,123,326

NUCLEAR FUEL ELEMENT AND METHOD FOR FABRICATING THE NUCLEAR FUEL ELEMENT

Katsutoshi Shinbo, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed May 19, 1975, Ser. No. 578,766
Claims priority, application Japan, May 22, 1974, 49-56504
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—68 10 Claims

1. A nuclear fuel element comprising: a sealed fuel cladding; nuclear fuel pellets contained within said sealed fuel cladding, said pellets having a size smaller than an internal dimension of said sealed fuel cladding to form a gap between said pellets and said sealed fuel cladding, and said pellets having an axial through hole disposed therethrough; a gas plenum contained within said sealed fuel cladding; gas circulation means including said gap and said axial through hole for causing circulation of helium gas around said nuclear fuel pellets within said sealed fuel cladding; means for causing (n, α) reaction disposed in said gas plenum; and a receptacle arranged in said gas plenum for containing said means for causing (n, α) reaction, wherein said receptacle includes a nozzle for discharging gas produced by said (n, α) reaction, said discharge nozzle being inserted into said axial through hole to define an annular passage between said discharge nozzle and said axial through hole, said gas circulation means being further constituted by said annular passage.

4,123,327

FUEL ASSEMBLY FOR A NUCLEAR REACTOR

Toshihiko Sugisaki; Tetsuo Horiuchi; Hideo Ogasawara; Shozo Yamanari, and Kenji Tominaga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 25, 1976, Ser. No. 689,817
Claims priority, application Japan, May 30, 1975, 50/64353
Int. Cl.[2] G21C *3/02*
U.S. Cl. 176—76 9 Claims

1. A nuclear reactor core comprising:

a housing,

upper and lower grid plates with a plurality of through holes, said upper and lower grid plates being secured in said housing, and

first and second fuel assemblies held between said upper and lower grid plates, each of said first fuel assemblies having,

an open-ended tubular first channel having channel walls

upper and lower first tie plates with a plurality of through holes, said upper and lower first tie plates being secured near upper and lower open ends of the first channel, respectively,

a plurality of first elongated fuel elements held between the upper and lower first tie plates, the first fuel element having a first clad tube and first fuel pellets packed therein, and

first openings for bypassing vapor generated in the first channel, the first openings being disposed in said walls of the first channel just below the first upper tie plate, each of said second fuel assemblies having,

an open-ended tubular second channel having channel walls,

upper and lower second tie plates with a plurality of through holes, said upper and lower second tie plates being secured near the upper and lower open ends of the second channel, respectively,

a larger number of second elongated fuel elements than that of first elongated fuel elements held between the upper and lower second tie plates, the second fuel element having a second clad tube and second fuel pellets packed therein, and

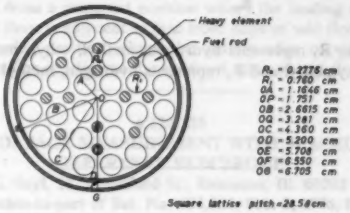
second openings for bypassing vapor generated in the second channel, the second openings being disposed in said walls of the second channel just below the second upper tie plates, total area of the second openings of each second fuel assembly being larger than that of the first openings of each first fuel assembly.

4,123,328

UTILIZATION OF HEAVY ELEMENTS IN THERMAL AND EPITHERMAL REACTORS

Alvin Radkowsky, Elizabeth, N.J.; Ji-Peng Chien, Tao Yuan, Taiwan; Chao-Yie Yang, Tao Yuan, Taiwan, and Horng-Ming Hsieh, Tao Yuan, Taiwan, assignors to Institute of Nuclear Energy Research, Atomic Energy Council, Taiwan

Filed Sep. 15, 1976, Ser. No. 723,482
Int. Cl.[2] G21C *1/04*
U.S. Cl. 176—78 28 Claims



1. In a heavy water moderated reactor in which rods of nuclear fuel are arranged in a plurality of fuel bundles, the improvement which comprises inserting at least one rod of a heavy element having high inelastic cross section for high energy neutrons having energies above 1 MEV and low capture cross sections, said heavy element being selected from the group consisting of lead, bismuth, compounds and mixtures thereof into the said reactor positioned to obtain reactivity increases whereby the amount of heavy water in the said heavy water moderated reactor can be reduced without substantially detrimentally affecting the reactivity of the reactor.

4,123,329

PROCESS FOR PRODUCING L-LYSINE BY FERMENTATION

Tsutomu Tanaka, Kobe; Yoshio Nakamura, Takasago; Koji Asahi, Takasago; Tadayoshi Shiraishi, Takasago, and Kenji Takahara, Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 27, 1977, Ser. No. 801,083
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—28 R 9 Claims

1. Process for producing L-lysine comprising aerobically culturing a microorganism belonging to the species *Nocardia alkanoglutinousa* and having the morphological, culturing and physiological properties of *Nocardia alkanoglutinousa* No. 223-59 (ATCC 31220) or *Nocardia alkanoglutinousa* No. 223-15 (ATCC 31221) in a medium and recovering L-lysine accumulated in said medium.

4,123,330

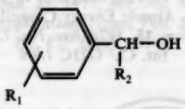
COLOR DIFFUSION TRANSFER PROCESS USING BENZYL ALCOHOL AND DERIVATIVES THEREOF

Jiro Takahashi, and Akihiko Miyamoto, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,210
Claims priority, application Japan, Oct. 16, 1975, 50-124727
Int. Cl.[2] G03C *7/00, 5/54*
U.S. Cl. 96—29 D 6 Claims

1. In a process for forming a color dye image in an image-receiving layer by diffusion transfer from a light-sensitive element comprising a silver halide emulsion and a diffusible dye developer which process comprises; image-wise exposing the light-sensitive element to light, subjecting the exposed light-sensitive element to an alkaline processing solution to correspondingly form an image of a diffusible dye developer in the light-sensitive element, and transferring, by diffusion, the diffusible dye developer from the light-sensitive element to the

receiving layer superimposed thereon during the subjecting step to form the color dye image in the receiving layer, the improvement which comprises the alkaline processing solution containing a compound represented by the formula



wherein R_1 represents hydrogen, methyl, ethyl, methoxy or hydroxymethyl and R_2 represents hydrogen, methyl or ethyl.

4,123,331

METHOD OF KEEPING THE CIRCULATING SPRINKLING WATER FOR THE UPTAKES OF COKE OVENS CLEAN

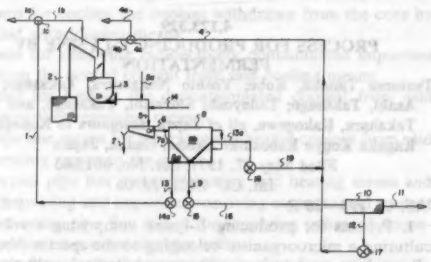
Dieter Laufhütte, Recklinghausen, Germany, assignor to Firma Carl Still Recklinghausen, Germany

Filed Dec. 23, 1976, Ser. No. 753,683

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1976, 2600130

Int. Cl.² C10B *27/04*

U.S. Cl. 201—4 **3 Claims**



1. A method of keeping the circulating sprinkling water which is delivered to the gas uptake of coke ovens clean, comprising directing sprinkling water to the uptake of the coke ovens and spraying it into the uptake, condensing and collecting a sprinkling water condensate from the uptake after it has cooled the gases flowing upwardly therein and picked up a quantity of tar, tar oils, hydrocarbons and solids, directing the sprinkling water condensate into a water-tar separator to separate out a sprinkling liquid from the condensate, directing the separated sprinkling liquid to the uptake, directing a tar which is substantially free of solids in an amount of from one to five times the amount by weight of the separated sprinkling liquid into the uptake along with the separated sprinkling liquid at least during the filling of the coke oven with coal and the start of a coking process which is a time of increased solid particle contamination in the uptake gases to form a tar-sprinkling water condensate, separating a thick-tar from the tar-sprinkling water condensate, and directing tar-sprinkling water condensate from the thick-tar separator to the water-tar separator, whereby during said period of increased solid particle contamination the ratio of tar to solids in the uptake gases is increased to permit the thick-tar separation so that a subsequent tar-water separation may take place.

4,123,332

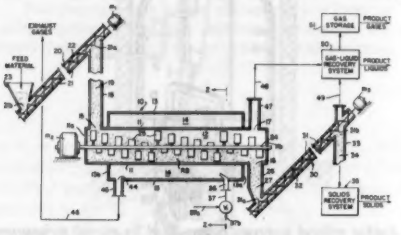
PROCESS AND APPARATUS FOR CARBONIZING A COMMINUTED SOLID CARBONIZABLE MATERIAL

Franz Rotter, Portland, Oreg., assignor to Energy Recovery Research Group, Inc., Portland, Oreg.

Filed Sep. 6, 1977, Ser. No. 830,753

Int. Cl.² C10B *1/06, 1/10, 47/20, 47/30*

U.S. Cl. 201—15 **26 Claims**



1. A process for carbonizing a comminuted solid carbonizable material to form combustible gases, vaporous hydrocarbons and solid residue which comprises:

(a) introducing said comminuted solid carbonizable material into an elongated horizontally-extending reaction zone under conditions to effectively exclude oxygen-containing gases therefrom;

(b) passing said comminuted solid carbonizable material as a bed through said reaction zone;

(c) agitating said bed of comminuted solid carbonizable material during passage through said reaction zone;

(d) introducing a burning mixture of an oxygen-containing combustion gas and fuel into a heating zone surrounding said reaction zone in a manner to spirally pass said burning mixture through said heating zone generally countercurrent to said bed of comminuted solid carbonizable material passing through said reaction zone thereby to carbonize said comminuted solid carbonizable material to form said combustible gases, vaporous hydrocarbons and solid residue;

(e) withdrawing combusted gases from said heating zone at a point below a horizontal plane passing through the axis of said heating zone;

(f) withdrawing said solid residue from an outlet end of said reaction zone under conditions to effectively exclude oxygen-containing gases therefrom; and

(g) withdrawing said combustible gases and vaporous hydrocarbons from said reaction zone under conditions to effectively exclude oxygen-containing gases.

4,123,333

DUCT EQUIPMENT FOR EXHAUSTING COKE GASES

Fritz Schulte, Meerbusch; Johann G. Riecker, Ratingen, and Günther Rozas, Erkrath, all of Fed. Rep. of Germany, assignors to Hartung, Kuhn & Co. Maschinenfabrik GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,217

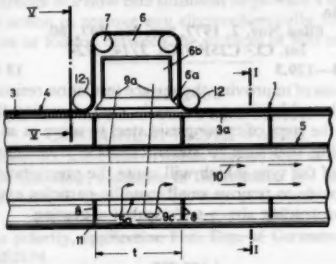
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1976, 2604950; May 17, 1976, 2621889

Int. Cl.² C10B *27/06*

U.S. Cl. 202—255 **7 Claims**

1. Equipment for exhausting gases from a movable gas collecting truck, said equipment comprising a stationary outer collection duct for exhausting the gases defining along an upper surface a slot-like opening, a plurality of divider means in said outer collection duct extending across portions of the interior axial cross section of said duct at longitudinally spaced locations to define a plurality of longitudinally spaced chambers, a flexible belt in contact with and covering said opening, a collecting truck being disposed on said outer duct beneath said belt and in communication with said opening, means for

shifting said collecting truck from chamber to chamber along said duct while lifting the belt off the collection duct to permit movement of said truck and exhausting of gases from the collecting truck to the collection duct, and an arcuate belt protection member disposed within said outer collection duct and longitudinally extending through and between each of said



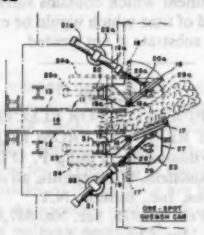
divider means, said belt protection member spaced from the belt for inhibiting the flow of gas against said belt and defining on its side opposite said belt an inner collection channel for directing exhaust gases received from the collecting truck in a given chamber out through the inner collection channel while preventing contact of said exhaust gases with the belt to prevent deterioration thereof.

4,123,334

RECIPROCATING COKE GUIDE EXTENSION

William G. Emery, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 9, 1978, Ser. No. 867,680
Int. Cl.[2] C10B *33/14*
U.S. Cl. 202—262 **12 Claims**



1. A reciprocating coke guide extension, for use in conjunction with a horizontal coke oven, comprising:

(a) a coke guide aligned, when in use, with said coke oven, further comprising:

(i) a rectangular vertical right wall;

(ii) a rectangular vertical left wall;

(iii) a rectangular horizontal floor connected, at its side edges, to the lower edges of said right wall and said left wall in the form of a channel;

(b) a vertical right wing the vertical rear edge of which is positioned adjacent to the vertical front edge of said right wall, being the edge of said right wall which is remote from said coke oven;

(c) means for pivotally connecting said front edge of said right wall to said read edge of said right wing;

(d) a vertical left wing the vertical rear edge of which is positioned adjacent to the vertical front edge of said left wall, being the edge of said right wall which is remote from said coke oven;

(e) means for pivotally connecting said front edge of said left wall to said rear edge of said left wing;

(f) means for pivoting said right wing;

(g) means for pivoting said left wing;

(h) a floor extension coextensively positioned to the front edge of said floor, being the edge of said floor remote from said coke oven, said floor extension being as wide as the summation of the lengths of said right wing and said left wing and the width of said floor, said floor extension being reciprocatingly mounted to extend beyond and retract from said front edge of said floor;

(i) means to linearly guide the motion of said floor extension;

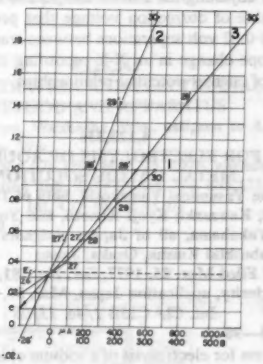
(j) means to reciprocate said floor extension in a linear direction from a retracted position where the leading edge of said floor is adjacent to said front edge of said floor to an extended position where the trailing edge of said floor extension is adjacent to said front edge of said floor.

4,123,335

VOLTAGE MEASUREMENT WITH SPACED REFERENCE ELECTRODE

Rogert G. Seyl, 1123 Mulford St., Evanston, Ill. 60202

Continuation-in-part of Ser. No. 654,854, Feb. 3, 1976, Pat. No. 4,060,461, and a continuation-in-part of Ser. No. 785,865, Apr. 7, 1977. This application Aug. 17, 1977, Ser. No. 825,282
Int. Cl.[2] G01N *27/46, 27/30*
U.S. Cl. 204—1 T **24 Claims**



1. In the measurement of corrosion currents of an Interface Electrode System through measurement of a range of current-potential relationships on a system including a nongaseous ionic conductor in which are immersed a measured electrode, an opposed electrode, and a reference electrode wherein the reference electrode is spaced from said measured electrode, the method of correcting for the sum of the IR voltage drops of ionic conduction between said measured and reference electrodes and of electronic conduction in a lead wire between a measuring device and the measured electrode, comprising the steps of:

establishing an IR drop across a potentiometer by passing a DC correction current therethrough, said IR drop having a voltage greater than the sum of the IR drops to be corrected for;

maintaining said correction current at a value proportional to a DC polarizing current of said measured current-potential relationship, and in a direction of flow fixed with relation to the direction of flow of said DC polarizing current;

providing one end and an arm of said potentiometer in series with a potential measuring circuit between said measured and reference electrodes, and in polarity to oppose the polarity of said IR drops; and

adjusting the arm of said potentiometer to deliver that value of correction voltage that produces approximately 0.02 volt separations between transition points of line slope change in an X-Y recording of said measured range of current-potential relationships.

10. In apparatus for measuring corrosion currents of an Interface Electrode System through measurement of a range of current-potential relationships on a system including a nongaseous ionic conductor in which are immersed a measured electrode, an opposed electrode, and a reference electrode wherein the reference electrode is spaced from said measured electrode, improvement through means to correct for the sum of IR voltage drops of ionic conduction between said measured and reference electrodes and of electrode conduction in a lead wire between a measuring device and the measured electrode, said apparatus comprising:

means for establishing an IR drop across a potentiometer by passing a DC correction current therethrough, said IR drop having a voltage greater than the sum of the IR drops to be corrected for;

means for maintaining said correction current at a value proportional to a DC polarizing current of said measured current-potential relationship, and in a direction of flow fixed with the relation to the directional flow of said DC polarizing current;

one end and an arm of said potentiometer in series with a potential measuring circuit between said measured and reference electrodes, and in polarity to oppose the polarity of said IR drops; and

means for adjusting the arm of said potentiometer to deliver that value of correction voltage that produces approximate ly 0.02 volt separations between transition points of line scope change in an X-Y recording of said measured range of current-potential relationships

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4,123,336

PROCESS FOR ELECTROLYSIS OF AQUEOUS ALKALI METAL HALIDE SOLUTION

Maomi Seko; Yasumichi Yamakoshi, both of Tokyo; Hirotsugu Miyauchi, Kawasaki; Kyoji Kimoto, and Yoshinori Masuda, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 25, 1977, Ser. No. 781,410

Claims priority, application Japan, Mar. 31, 1976, 51-35594

Int. Cl.[2] C25B *1/46, 13/08*

U.S. Cl. 204—98 **7 Claims**

1. A process for electrolysis of a sodium chloride solution in an electrolytic cell in which anode and cathode are separated by a cation exchange membrane to divide said cell into anode and cathode chambers, said cation exchange membrane comprising at least one fluorocarbon polymer which contains sulfonic acid cation exchange groups and at least one cation exchange group with weaker acidity than sulfonic acid group, the cation exchange groups in surface stratum on the cathode side of the membrane being richer in said weaker cation exchange group than the balance of the membrane, the proton concentration in the anolyte being maintained at a value up to the critical proton concentration $C_{H^+}{}^o$ as defined by the following formula:

$$C_{H^+}{}^o = (id/FD_{H^+})(l - y - t_{H^+})$$

wherein i represents current density (A/dm^2), F the Faraday constant: 96,500 coulomb/eq., d the thickness of the desalted layer (cm), y the transport number of sodium ions through the membrane, D_{H^+} the diffusion coefficient of protons in the anolyte (cm^2·sec^{-1}), and t_{H^+} the transport number of the protons in the anolyte of the formula:

$$t_{H^+} = \frac{D_{H^+}}{(D_{H^+} + D_{Cl^-}) + (C_{Na^+}/C_{H^+}^{o})(D_{Na^+} + D_{Cl^-})}$$

wherein D_{Na^+} and D_{Cl^-} represent diffusion coefficients of sodium ions and chlorine ions in the anolyte, respectively, and C_{Na^+} concentration (N) of sodium ions in the anolyte, respectively.

4,123,337

METHOD OF IMPROVING THE SURFACE INSULATION RESISTANCE OF ELECTRICAL STEELS HAVING AN INSULATIVE COATING THEREON

David C. Brewer, Miamisburg; James D. Evans; Dale M. Kohler, both of Middletown, and Michael H. Haselkorn, Franklin, all of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed Nov. 2, 1977, Ser. No. 847,760

Int. Cl.[2] C25F *3/06, 3/14, 3/24*

U.S. Cl. 204—129.3 **13 Claims**

1. A process of improving the surface insulation resistance of an electrical steel having a primary insulative coating thereon comprising the steps of causing said steel to serve as an anode and subjecting said steel to electrochemical treatment in an electrolyte of the type which will cause the precipitation of a metal hydroxide to remove small metallic particles extending through a protruding above said insulative coating.

4,123,338

METHOD FOR PREVENTION OF FOULING AND CORROSION UTILIZING TECHNETIUM-99

Carl B. Wootten, Rte. 1, Keswick, Va. 22947

Continuation-in-part of Ser. No. 473,691, May 28, 1974, Pat. No. 4,017,370. This application Jan. 5, 1977, Ser. No. 757,079

The portion of the term of this patent subsequent to Apr. 12, 1994, has been disclaimed.

Int. Cl.[2] C23F *1/00;* C25D *3/54;* B63B *59/00*

U.S. Cl. 204—147 **10 Claims**

1. A method for the prevention of fouling of a substrate in contact with water, which comprises:

including in or coating on said substrate prior to its exposure to said water, an amount of technetium-99 effective to prevent the growth of aqueous organisms on said substrate;

and thereafter exposing said substrate to a fresh water or marine environment which contains sufficient organisms, and for a period of time which would be expected to cause fouling of said substrate if not treated.

4,123,339

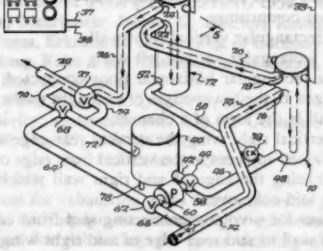
METHOD AND APPARATUS FOR ELECTROCHEMICAL CONTAMINANT REMOVAL FROM LIQUID MEDIA

Stephen B. Gale, Williamsville; Phillip P. O'Donnell, Buffalo, and Stanley Bruckenstein, Williamsville, all of N.Y., assignors to Andco Industries, Inc., Buffalo, N.Y.

Filed Feb. 7, 1975, Ser. No. 547,940

Int. Cl.[2] C02C *5/12*

U.S. Cl. 204—149 **6 Claims**



1. In a method for electrochemically removing from an ionizing medium a contaminant ion which is capable of forming an insoluble iron compound or complex, said method including passing an electric current between an anode electrode which has a surface or a protion of a surface thereof of iron, iron alloy or insoluble iron compound, and a cathode electrode,

through the ionizing medium containing the ion to be removed, so as to produce an insoluble iron compound or complex with the contaminant ion, and removing such insoluble material from the ionizing medium, the improvement comprising treating the electrodes with a dilute inorganic acid solution by flowing said acid solution along and between the surfaces of said electrodes at a flow rate sufficient to provide a mechanical washing action to remove any electrochemically formed substances on or lodged between the surfaces of said electrodes.

4,123,340

METHOD AND APPARATUS FOR TREATING METAL CONTAINING WASTE WATER

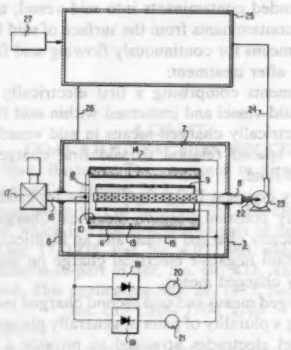
Roland Kammel, and Hans-Wilhelm Lieber, both of Berlin, Fed. Rep. of Germany, assignors to Gotzelmann KG Industrieabwasser-Anlagen, Stuttgart, Fed. Rep. of Germany

Filed Nov. 22, 1977, Ser. No. 854,004

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652934

Int. Cl.² C02C *5/12*

U.S. Cl. 204—149 **12 Claims**



1. Method for treating metal containing waste water employing a vessel containing the waste water in which there is provided at least one anode and a cathode consisting essentially of electrically conductive particles and in which the waste water is subjected to electrolysis during which the waste water and the particles of the cathode are being moved, comprising: arranging the particles of the cathode in a cage closed on all sides whose walls are perforated, moving the cage by an external force during the electrolysis in order to move the particles and simultaneously moving the waste water by producing a forced flow through the particles.

4,123,341

APPARATUS AND PROCESS FOR TREATING CONTAMINATED WATER

Jurgen Gnieser, Weinfelden, and Luciano Pelloni, Zurich, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 6, 1977, Ser. No. 830,809

Claims priority, application Switzerland, Sep. 27, 1976, 12183/76

Int. Cl.² C02B *1/82*

U.S. Cl. 204—152 **3 Claims**

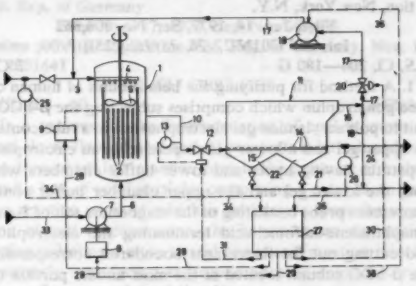
1. A process for treating contaminated water having electrically-charged suspended particles therein, said process comprising the steps of

passing the contaminated water through an inlet line into an electrical field in an electro-coagulator to discharge the electrically-charged particles while simultaneously dissociating at least some of the water;

coagulating the discharged particles;

thereafter separating the coagulated particles from the water in a flotation stage and removing a flow of clarified water from the flotation stage through an outlet line;

measuring the turbidity of the water flowing through at least one of the inlet line and the outlet line; and



controlling the current density in the coagulator in response to the measured turbidity whereby the voltage of said electro-coagulator is increased in response to an increase in turbidity and decreased in response to a decrease in turbidity below a predetermined level.

4,123,342

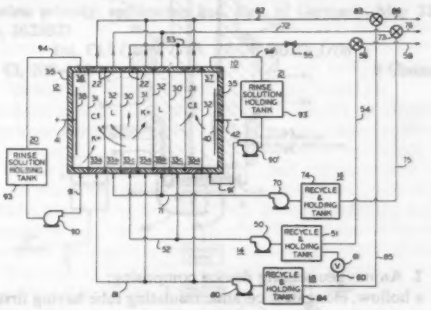
ULTRAFILTRATION AND ELECTRODIALYSIS METHOD AND APPARATUS

Richard M. Ahlgren, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Division of Ser. No. 670,159, Mar. 25, 1976, abandoned. This application Jun. 9, 1977, Ser. No. 805,121

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 P **7 Claims**



1. A filtration process comprising:

providing a filtration system including at least one ultrafiltration cell group which is defined by an ultrafiltration membrane disposed between a pair of ion permeable membranes, a first one of which is cation selective and the other of which is at least cation and anion permeable,

applying an electric field across said cell group, the cathode being arranged on the side of said housing said first ion-permeable membrane, and

injecting a fluid to be simultaneously ultrafiltered and deionized under pressure into a first cell of said cell group formed by said ultrafiltration membrane and one of said ion permeable membranes, whereby ionic constitutents of said fluid are drawn out of said first cell in one direction relative to said field and whereby permeate is forced through said ultrafiltration membrane into a second cell of said cell group.

4,123,343
PURIFICATION OF GLYCOPROTEINS AND IMMUNIZATION THEREWITH

John Krupey, Montreal, and Ewald F. Welchner, LaSalle, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

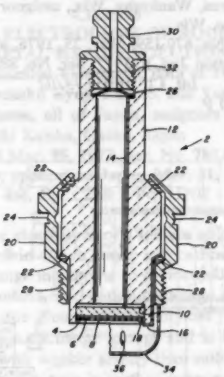
Filed Jun. 14, 1977, Ser. No. 806,562
Int. Cl.[2] G01N *27/26, 33/16;* C25B *7/00*
U.S. Cl. 204—180 G 5 Claims

1. A method for purifying the beta subunit of human chorionic gonatrophin which comprises subjecting the β-hCG subunit to polyacrylamide gel electrophoresis in a tube containing an upper gel and a lower gel suspended in an electrophoretic apparatus having upper and lower buffer chambers wherein both the lower gel and the upper chamber buffer contain a fluorescent probe consisting of the magnesium salt of 8-anilino-1-naphthalene-sulfonic acid terminating the electrophoresis, and cutting out the fluorescent boundaries corresponding to the β-hCG subunit located at the most anodic portion of the gel.

4,123,344
TWO FIRE CERAMIC SEALED OXYGEN SENSING DEVICE AND METHOD OF FORMING SAME

Donald C. Davis, Fostoria, Ohio, assignor to Bendix Autolite Corporation, Fostoria, Ohio

Filed Apr. 15, 1977, Ser. No. 787,721
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S 1 Claim

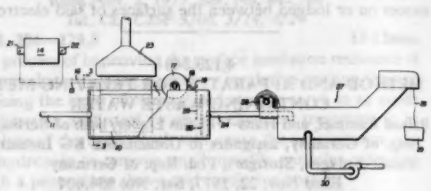


1. An oxygen sensing device comprising:
a hollow, elongated, ceramic insulating tube having first and second open ends, said first end having a recess formed therein coaxial with the tube;
a wafer formed of a solid electrolyte ceramic material positioned in said recess and secured therein by direct engagement with walls of said recess to provide an inner surface of the wafer facing the interior of the hollow tube and an outer surface of the wafer facing away from the hollow tube;
first conductive means along the inside of the tube in contact with the inner surface of the wafer;
a threaded recess in said second end of the insulating tube;
a threaded hollow conductive means positioned in the threaded recess, and engaged with said insulating tube, in conductive contact with said first conductive means;
second conductive means along the outside of the tube in contact with the outer surface of the wafer; and
a metal shell intermediate the ends of the insulating tube and enclosing a portion of the same, said shell being in contact with the second conductive means.

4,123,345
LIQUID TREATING APPARATUS

Don L. Shettel, Bloomfield Hills, Mich., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Division of Ser. No. 499,670, Aug. 22, 1974, Pat. No. 3,970,536.
This application Mar. 29, 1976, Ser. No. 671,213
Int. Cl.[2] C02C *5/12;* B03C *5/00*
U.S. Cl. 204—275 2 Claims



1. An apparatus for gravitationally segregating a fluid from contaminants suspended therein, comprising:
a vessel; delivery means for continuously flowing said fluid with suspended contaminants into said vessel; means for removing contaminants from the surface of said fluid; and discharge means for continuously flowing said fluid from said vessel after treatment;
the improvements comprising a first electrically charged means in said vessel and immersed within said fluid, and
a second electrically charged means in said vessel and immersed in spaced relation to said first charged means within said fluid,
a substantially constant DC power source for establishing a substantially constant positive electrical charge on said first electrically charged means and an identical, substantially constant negative electrical charge on said second electrically charged means,
said first charged means and said second charged means each comprising a plurality of pairs of generally planar, vertical and parallel electrodes arranged to provide a series of oppositely charged conductors in alternating, side-by-side relationship, said electrodes comprised of a material substantially electrochemically inert with respect to said fluid,
said first charged means electrodes and said second charged means electrodes arranged such that the continuous horizontal flow of said fluid through said vessel is generally parallel to said electrodes, said delivery means and said discharge means so arranged on said vessel as to regulate the flow of said fluid through said vessel such that an electrophoretic attraction of said suspended contaminants toward said first charged means electrodes occurs with resulting agglomeration of said suspended contaminants between said first and second charged means electrodes, said second charged means electrodes electrolytically generating hydrogen bubbles that attach to the agglomerated contaminants and float the contaminants to the surface of the fluid within said vessel.

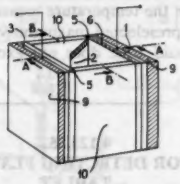
4,123,346
ELECTROPHORETIC DEVICE

Jean Luc Ploix, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 10, 1977, Ser. No. 795,424
Claims priority, application France, May 11, 1976, 76 14161
Int. Cl.[2] C25D *1/12;* G03G *13/00*
U.S. Cl. 204—299 R 15 Claims

1. An electrophoretic device comprising:
two outer plates and liners assembled in a fluid-tight manner the inner walls of said outer plates and liners forming a container accomodating a suspension of solid electrically charged particles in a liquid medium;

electrodes on the facing faces of said outer plates between which a potential difference is applied in operation.



an electret layer consisting of a layer of dielectric material carrying a permanent electrical charge said electret layer coating at least pat of the inner walls of the device.

4,123,347

COAL LIQUEFACTION PROCESS

Peter S. Maa, Baytown, Tex., assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 753,215, Dec. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 641,489, Dec. 17, 1975, Pat. No. 4,022,680, which is a continuation-in-part of Ser. No. 607,433, Aug. 25, 1975, abandoned. This application Sep. 26, 1977, Ser. No. 836,821

Int. Cl.² C10G *1/04, 1/08*

U.S. Cl. 208—8 **13 Claims**

1. A process for liquefying a particulate coal feed to produce useful petroleum-like liquid products, which comprises:

(a) contacting, in a series of coal liquefaction zones, graded with respect to temperature such that the temperature ascends from the initial to the final zone of the series, an admixture of a polar compound selected from the group consisting the low molecular weight heterocyclic oxygen compounds containing from about 2 to about 6 fused rings, one or more of which is a five- or six-membered heterocyclic ring having from four to five carbon atoms in the nucleus and from one to two atoms of oxygen and the low molecular weight heterocyclic sulfur compounds containing from 2 to about 6 fused rings, one or more of which is a five- or six-membered heterocyclic ring having from four to five carbon atoms in the nucleus and from one to two atoms of sulfur a hydrogen donor solvent and particulate coal;

the initial zone being maintained at a temperature between about 70° F. and 750° F. while providing a residence time ranging from about 20 minutes to about 150 minutes to disperse the coal, and

the final zone being maintained at a temperature between about 750° F. and 950° F. while maintaining a residence time ranging from about 10 minutes to about 70 minutes, sufficient to hydroconvert and liquefy the coal,

(b) separating the product from the coal liquefaction zone into fractions inclusive of a liquid solvent fraction with contains at least 30 weight percent hydrogen donor compounds,

(c) hydrogenating said liquid solvent fraction in a hydrogenation zone, and

(d) recycling the hydrogenated liquid solvent mixture to the initial zone of the series.

4,123,348

PROCESS FOR CATALYTIC HYDROGENATION OF COAL

Helmut Wurfel, Niederwurzbach, Fed. Rep. of Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrucken, Fed. Rep. of Germany

Filed Nov. 17, 1976, Ser. No. 742,605

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1975, 2551641

Int. Cl.² C10G *1/08*

U.S. Cl. 208—10 **5 Claims**

1. In a process for the hydrogenation of coal wherein an original slurry flow of coal and oil reactants is introduced into and hydrogenated in a reaction zone in the presence of hydrogen and a bed of solid particles comprising a catalyst, to produce a reaction product which is withdrawn from the upper portion of said reaction zone, the improvement comprising imparting pulsating motion to said bed in said reaction zone by intermittantly introducing and superimposing onto said original slurry flow one of the following:

a. recycled reaction product

b. slurry of coal and oil whereby a pulsating motion is imparted to said solid particles in said bed.

4,123,349

SEPARATION OF SOLIDS CONTAINING RESIDUES FROM LIQUID FRACTIONS OF A COAL HYDROGENATION PROCESS USING AN EXPANSION ENGINE AND A PRESSURE RELEASE MEANS

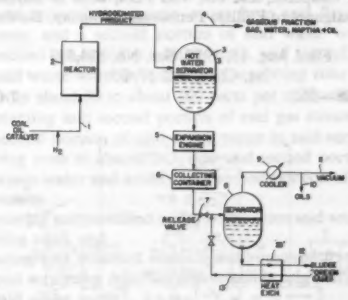
Helmut Wurfel, Niederwurzbach, Germany, assignor to Saarbergwerke Aktiengesellschaft, Saarbrucken, Germany

Filed Jun. 1, 1977, Ser. No. 802,517

Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623022

Int. Cl.² C10G *1/08, 37/04;* B01D *3/06*

U.S. Cl. 208—10 **8 Claims**



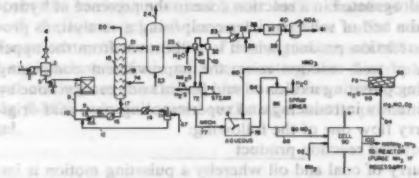
1. In a process for separation of distillation oils from a liquid product fraction comprising solids containing residues resulting from a hydrogenation process for coal at elevated pressures and temperatures, and from which said product fraction the lower boiling components of said product fraction are separated by expansion and subsequent separation of the phases, the improvement comprising expanding said liquid product fraction in at least two successive steps, a first expansion step effected in an expansion engine in liquid phase wherein no evaporation of said distillation oils occurs, and a second expansion-evaporation step effected in a pressure release means, whereby solids containing residues are separated from said vaporized distillation oils.

4,123,350

PROCESS FOR DESULFURIZATION OF RESIDUA WITH SODAMIDE-HYDROGEN AND REGENERATION OF SODAMIDE

William C. Baird, Jr.; Roby Bearden, Jr., and Ralph L. Bollinger, Jr., all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 571,955, Apr. 28, 1975, Pat. No. 4,017,381.
This application Aug. 11, 1976, Ser. No. 713,510
Int. Cl.[2] C10G *13/06*; B01J *23/04, 23/90*
U.S. Cl. 208—108 10 Claims



1. A process for the desulfurization and hydroconversion of a sulfur-containing petroleum oil feedstock, which comprises;

contacting a sulfur-containing petroleum oil feedstock, in a desulfurization-hydroconversion zone, with sodamide in the presence of added hydrogen at a temperature of from between 400–2,000° F., said feedstock being maintained substantially in the liquid phase, thereby forming an oil-salt mixture comprising a sulfur-reduced oil phase and a salt phase, said salt phase comprising sodium sulfur salts;

contacting said mixture with water to form an aqueous sodium sulfur salt phase and to separate the oil phase from the aqueous sodium sulfur salt phase;

converting said aqueous sodium sulfur salts to sodium nitrate;

converting said sodium nitrate to sodamide; and

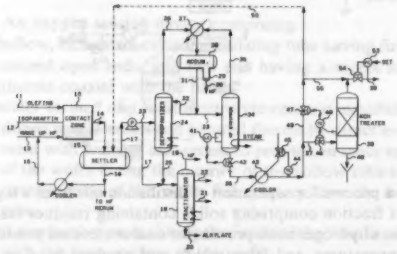
returning at least a portion of the so-regenerated sodamide to said desulfurization-hydroconversion zone.

4,123,351

HYDROCARBON PURIFICATION PROCESS

Charles C. Chapman, and Joe Van Pool, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 15, 1977, Ser. No. 824,583
Int. Cl.[2] C10G *17/00*
U.S. Cl. 208—262 7 Claims



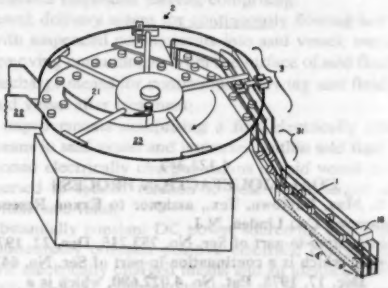
1. In a process for removing HF acid from hydrocarbon streams containing same by contacting with solid KOH in a treating zone, the step of preventing an excessive temperature increase above a preselected maximum allowable temperature and subsequent explosion in said treating zone when unexpected excess HF is present in said stream charged to said treating zone comprising obtaining a temperature measurement in the system indicative of an excess amount of HF which would cause an excessive temperature increase in said treating zone and controlling the flow of said stream passed to said treating zone in response to said temperature measurement by decreasing and/or terminating the flow of said stream charged to said zone when the temperature measurement reaches and/or exceeds said preselected maximum value so that the temperature within said zone does not exceed said preselected value.

4,123,352

APPARATUS FOR DETECTING FLAWS IN CIRCULAR TABLET

Masao Yamamoto, Amagasaki, and Sumio Iwanaga, Takatsuki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Jan. 22, 1976, Ser. No. 651,236
Claims priority, application Japan, Feb. 21, 1975, 50-22165
Int. Cl.[2] B07C *5/342*
U.S. Cl. 209—546 10 Claims



1. An apparatus for detecting flaws in tablets having a circular cross-section, which comprises: a transferring pathway adapted to bridge equipment in a tablet processing line including a parallel spaced pair of rails having shoulders on opposed faces thereof capable of carrying the tablets with the circular cross-section thereof substantially upright, said pathway being arranged so that the parallel lines of the shoulders have an inclination with respect to the horizontal sufficient to impart to a normal tablet being carried a self-rotating and travelling tendency along the pathway, and side plates above the shoulders capable of permitting unobstructed passage therebetween of travelling tablets with the circular cross-section thereof substantially upright and adapted to prevent smooth passage of defective tablets in a position diverging substantially from an upright position.

4,123,353

METHOD AND APPARATUS FOR MEASURING THE CONTENT OF A LOW-MOLECULAR WEIGHT COMPOUND IN A COMPLEX MEDIUM

Bo H. Håkansson; Ulf T. G. Nylén, and Lars A. G. Qvarnström, all of Lund, Sweden, assignors to Gambro AB, Lund, Sweden

Filed Nov. 29, 1977, Ser. No. 855,604
Claims priority, application Sweden, Nov. 30, 1976, 76133750
Int. Cl.[2] D01D *13/00*
U.S. Cl. 210—22 C 10 Claims

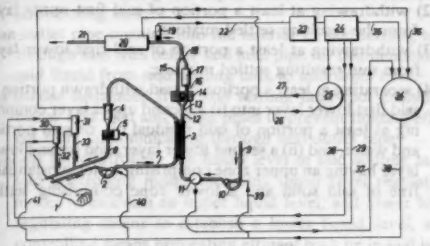
8. A method for measuring the content of a low-molecular weight compound in a complex medium, comprising the steps of:

conveying said complex medium through a dialyzer,

supplying dialysis fluid to said dialyzer so that it receives a portion of the low-molecular weight compound by diffusion from said complex medium to produce a dialysate,

conducting the dialysate produced from said dialyzer to a measuring unit via a main flow line or a shunt flow line,

effecting the dialysate in at least one of said main and shunt flow lines, and



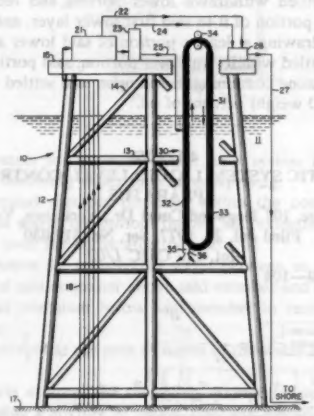
comparing the dialysate coming from said main flow line and the dialysate coming from said shunt flow line.

4,123,354

METHOD OF REMOVING OIL FROM WATER

Robert E. Williams, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Nov. 7, 1977, Ser. No. 849,158
Int. Cl.[2] B01D *15/00, 33/14*
U.S. Cl. 210—40 6 Claims



1. A method of removing oil from a mixture of oil and water produced on an offshore rig comprising:

injecting said oil and water mixture downwardly into a partially submerged vertical pipe adjacent said rig;

upwardly passing through said pipe an endless oleophilic fibrous cord to countercurrently contact said oil and water mixture and selectively absorb oil from said mixture, said fibrous cord having sufficient residence time within said pipe to substantially reduce the oil content of said oil and water mixture; and

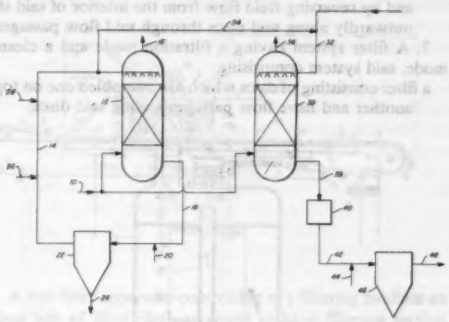
removing the oil collected by said fibrous cord at the surface and returning said cord to the lower end of said pipe for renewed contact with said oil and water mixture.

4,123,355

SIMULTANEOUS TREATMENT OF SO_2 CONTAINING STACK GASES AND WASTE WATER

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Jerry C. Poradek, Houston, Tex., and Dwight D. Collins, Bakersfield, Calif.

Filed Nov. 21, 1977, Ser. No. 853,705
Int. Cl.[2] C02B *1/34;* B01D *53/34*
U.S. Cl. 210—50 11 Claims



1. A process for the simultaneous treatment of a sulfur dioxide containing gas stream and waste water of the type derived from domestic sewage comprising:

introducing a first portion of said gas stream and a first portion of said waste water into a first gas-liquid scrubbing zone, said first portion of said waste water containing from about 500 to about 1200 parts per million iron and having a pH of from about 1.5 to about 3, the temperature in said first scrubbing zone being from about 120° to about 160° F.,

contacting said first portion of said gas stream and said first portion of said waste water in said first scrubbing zone to absorb SO_2 into said waste water, the contact time in said scrubbing zone being sufficient to permit substantial oxidation of absorbed SO_2, said waste water being recycled through said first scrubbing zone,

introducing a second portion of said gas stream, a portion of said recirculating waste water from said first scrubbing zone, and a second portion of said waste water into a second gas-liquid scrubbing zone, said second portion of said waste water in said second scrubbing zone containing from about 50 to about 200 parts per million iron,

contacting said second portion of said gas stream with said second portion of said waste water in said second scrubbing zone to absorb SO_2 into said second portion of said waste water and acidify said second portion of said waste water,

removing said acidified waste water from said second scrubbing zone, and

treating said acidified waste water removed from said second scrubbing zone to remove solids originally present in said waste water.

4,123,356

FILTER CLEANING METHOD AND FILTER SYSTEM

Yoshikazu Sugimoto, Hitachi; Hideo Yusa, Katsuta; Yomei Kato, Hitachi; Kunio Kamiya, Hitachi, and Makoto Kikuchi, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,150
Claims priority, application Japan, Feb. 25, 1976, 51-18883
Int. Cl.[2] B01D *41/04*
U.S. Cl. 210—67 9 Claims

1. A filter cleaning method, in which fluid to be processed is filtered through fluid passages defined among a central hollow shaft and a plurality of discs that are centered on said shaft, one

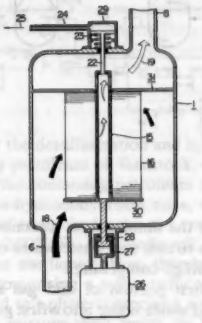
on top of another in press-contacting relation by an external force imposed upon said discs by a lifting member, when said lifting member is in engagement with said central hollow shaft, said method comprising the steps of:

relieving said discs from said external force by disengaging said central hollow shaft from said lifting member in order to provide clearances among said discs sufficient to facilitate cleaning thereof; and

cleaning said flow passages subsequently both by simultaneously rotating said discs to produce centrifugal force and by reversing fluid flow from the interior of said shaft outwardly along said discs through said flow passages.

7. A filter system having a filtration mode and a cleaning mode, said system comprising:

a filter consisting of discs which are assembled one on top of another and have flow passages among said discs;



a filter-supporting tube extending through the center of said filter and having a through hole leading to said flow passages;

a supporting-tube lifting member engaging and thereby lifting said filter supporting tube so as to bring said discs into press-contacting relation for said filtration mode, and for disengaging said filter supporting tube for said filter cleaning mode, so as to cause said discs not to be in press-contacting relation, thereby providing clearances therebetween sufficient to facilitate cleaning of said discs;

disc cleaning means for said cleaning mode, comprising:

a rotary machine for rotating said discs;

means for inducing reverse fluid cleaning of said discs when said clearances are provided therebetween.

4,123,357

RECOVERING OIL FROM EMULSION BY STIRRING, HEATING, AND SETTLING

Luther D. Clements, Lubbock, Tex.; Michael D. Hannan, Scotch Plains, N.J.; Robert J. Hinds, San Rafael, and Richard W. Vose, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 22, 1977, Ser. No. 809,134
Int. Cl.² C02B *1/02*
U.S. Cl. 210—71 **8 Claims**

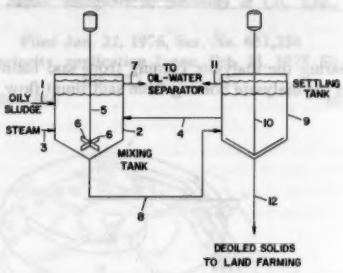
1. A process for treating sludge containing oil, water and particulate solid, said sludge having, in parts by weight, a free-water content in the range of from about 4 to 50 parts per part of said solid, comprising:

(1) forming a first upper layer comprising oil or oil and water and a first lower layer comprising an aqueous suspension of said solid and residual oil by stirring said sludge while maintaining the resulting mixture at a mixing temperature in the range above about 95° F. and below the boiling point thereof, and thereafter maintaining said mixture under sludge settling conditions including a settling temperature in the range above 95° F. and below the boiling point thereof for a period in the range of from about 0.5 to 24 hours and sufficient for said first layers to form, said stirring expending for each 1000 gallons of said sludge an amount of mechanical energy in the range of from about 0.1 to 5 horsepower;

(2) withdrawing at least a portion of said first upper layer from the resulting settled mixture;

(3) withdrawing at least a portion of said first lower layer from said resulting settled mixture;

(4) separating at least a portion of said withdrawn portion of said first lower layer into (i) a second upper layer comprising at least a portion of said residual oil, or said portion and water; and (ii) a second lower layer, said second lower layer having an upper zone comprising water substantially free of said solid and a lower zone comprising settled



solid, the remainder of said residual oil, and water by maintaining said withdrawn portion of said first lower layer under sludge settling conditions for a period in the range from about 0.5 to 48 hours;

(5) withdrawing at least a portion of said second upper layer from the resulting settled withdrawn portion of said first lower layer;

(6) withdrawing at least a portion of said upper zone from said settled withdrawn lower portion and returning at least a portion of it to said first lower layer, and

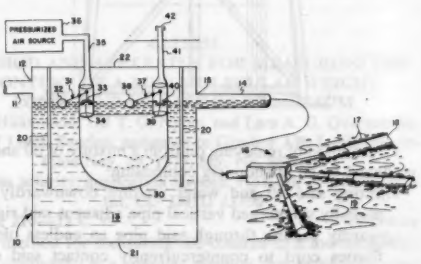
(7) withdrawing at least a portion of said lower zone from said settled withdrawn lower portion, said portion of said lower zone containing, based upon said settled solid, less than 30 weight percent of oil.

4,123,358

SEPTIC SYSTEM LIQUID LEVEL CONTROL APPARATUS

Bruce Flagge, 107 Dogwood Court Dr., Yorktown, Va. 23490

Filed Jul. 25, 1977, Ser. No. 819,030
Int. Cl.² C02C *1/02*
U.S. Cl. 210—104 **10 Claims**



1. A septic system comprising:

a settling tank having an inner floor, roof and wall forming a volume wherein sedimentation and anaerobic decomposition of effluent can occur;

a drain field whereby liquid is absorbed from said septic system;

an inlet pipe opening into the interior of said settling tank through said wall between said roof and said inner floor for communicating said liquid from an effluent source to said settling tank;

an outlet pipe opening into the interior of said settling tank through said wall below said inlet pipe for communicating said liquid from said settling tank to said drain field;

a barrier suspended from said settling tank roof extending below said inlet and outlet pipes to prevent floating effluent from communicating through said outlet pipe;

means for controlling the liquid level in said settling tank, said controlling means including upper level regulating means to establish an upper liquid level, and lower level regulating means to establish a lower liquid level, said controlling means preventing effluent back up in said inlet pipe, preventing surface seepage at said drain field, and enabling more efficient anaerobic decomposition of said effluent.

4,123,359

WATER PURIFYING SYSTEM AND PUMP THEREFOR

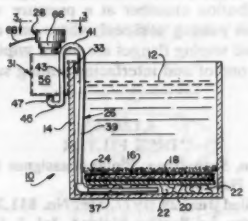
John D. Smith, 5748 King Dr., Chicago, Ill. 60637

Continuation-in-part of Ser. No. 566,004, Apr. 7, 1975, Pat. No. 4,002,566. This application Dec. 22, 1976, Ser. No. 753,202

The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.

Int. Cl.² E04H *3/20*

U.S. Cl. 210—169 **9 Claims**



1. A system for purifying water, said system including a container confining water therein, comprising:

a perforated member disposed within the container and spaced above the bottom thereof and extending substantially over the entire area thereof;

pump means for transferring water between an upper portion of said container above said member and the bottom of said container below said member to recirculate the water;

means located at the path of travel of the water for aerating it;

a bacteria culture bed overlying said perforated member including a mixture of gravel, clay and one selected from the group consisting of skeletal residue material, readily decomposable vegetal material and skeletal residue material and readily decomposable vegetal material; and

said pump means including conduit means disposed in said path of travel of the water and having one of its end portions disposed in the space under said perforated member, and a pump connected to the other end of said conduit means and positioned at least partially outside of the container for transferring water via said conduit means between the underside of said perforated member and said pump, water flow means disposed in said path of travel of the water positioned at least partially outside of the container and connecting in fluid communication said pump and the water in the space above said perforated member.

4,123,360

METHOD AND APPARATUS FOR THE LIQUID TREATMENT OF FILTER CAKES

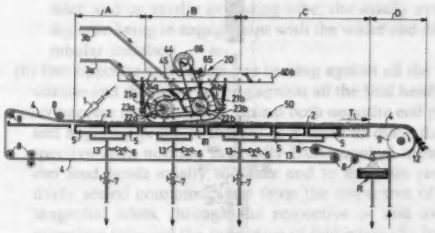
Paul Havalda, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 2, 1976, Ser. No. 672,915

Claims priority, application Switzerland, Apr. 4, 1975, 4295/76

Int. Cl.² B01D *33/00, 33/34*

U.S. Cl. 210—216 **12 Claims**



1. A belt filter apparatus comprising as a filtering medium an endless belt of filter cloth arranged to have filtering section including a separating zone followed by a liquid treatment zone; vacuum trays disposed beneath said filtering section means for feeding material to be filtered into said separating zone at least one agitator means positioned above said filtering section in said liquid treatment zone, said agitator means including at least one rotatable agitator having an axis of rotation parallel to and extending across the filter cloth and comprising a plurality of agitating vanes extending substantially radially from said axis of rotation; a semicylindrical hood covering the agitator, the central longitudinal axis of the hood being coaxial to the axis of rotation of the agitator; and means for supplying treatment liquid to the agitator within said hood; and further comprising means for generating relative movement between said filter cloth and said agitator means and means for rotating said agitator in a direction opposite to that of said relative movement.

4,123,361

LINT FILTER ASSEMBLY

Loren H. Marschman, 411 N. Pine, Arlington Heights, Ill. 60004

Filed May 27, 1977, Ser. No. 801,057

Int. Cl.² B01D *25/08*

U.S. Cl. 210—232 **8 Claims**

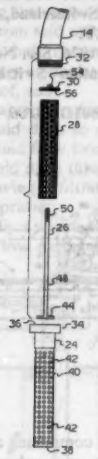
1. A filter assembly for removing lint from water discharged through a hose from a washing machine, comprising:

an elongate tubular housing having an inlet end releasably connectable with the hose, another end opposite the inlet end, and a side wall extending between the opposite ends, said side wall having a plurality of fluid passageways for discharging water along the length thereof:

an elongate tubular filter element located within the body; and

a filter removal element within the body, said removal element having a section underlying the filter element adjacent the other end of the body, in loose supportive engagement therewith, said section being substantially coextensive with and having a shape conforming to that of the inside of the housing to substantially close the other end for causing the discharge water to exit through the filter element along the length of the housing, and an elongate stem extending from the section through the filter element to adjacent the open end, said stem being manually acces-

sible through the open end of the body for withdrawal of the removal element from the body, said underlying section carrying the filter element out of the body when the filter removal element is withdrawn.

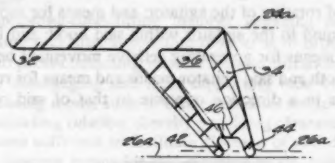


4,123,362

PRESSURIZED SEAL SUCH AS FOR DRUM SCREENS

Hosein Mansouri, New Berlin, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Nov. 2, 1977, Ser. No. 847,960
Int. Cl.[2] B01D *33/34*
U.S. Cl. 210—232 **6 Claims**



1. In a drum screen apparatus for screening raw water and the like and including a stationary structure including a raw water delivery channel and a screened water holding tank wherein a given elevation of screened water is maintained and further including a drum disposed to receive water from said channel and to rotate within said tank on a horizontal axis with the uppermost section of its cylindrical surface above said elevation for cleaning purposes, said structure and said drum having interfacing sealing surfaces, said structure having a wiping seal mounted on its sealing surface so as to engage the sealing surface on said drum and prevent any passage of raw water therebetween from said channel into said tank, an improved wiping seal for said apparatus comprising (A) a flexible, elongated element including (1) a tubular body defining a distribution chamber having opposite ends, said body being of trapezoidal section and having larger and smaller parallel sides and two converging sides, (2) spaced, parallel wiping flanges extending from the two converging sides and in wiping engagement with the sealing surface of said drum, (3) a series of ports in the smaller side and between said flanges and opening from said chamber, (B) means closing said opposite ends of said distribution chamber, (C) a clean water supply connection opening into said chamber at one or both of said opposite ends thereof and (D) means securing the larger side to the sealing surface on said structure with said opposite ends adjoining each other above said elevation and so that the smaller side is axially offset toward said channel such that the larger side pivots and the smaller side cooperatively bows outwardly to compensate for variations in the annular space between the sealing surfaces, said seal being adapted to be supplied with clean water at a pressure which prevents raw water from passing said seal where such wiping engagement may not occur.

5. In a drum screen apparatus for screening a liquid, said apparatus comprising:

(a) a stationary structure comprising:
  (i) a liquid delivery channel,
  (ii) a screened liquid holding tank, and
  (iii) means for maintaining a pre-determined elevation of screened liquid in said holding tank;
(b) a screening drum disposed to receive liquid from said delivery channel and to rotate within said tank, said structure and said drum having interfacing sealing surfaces; and
(c) a wiping seal mounted on one or the other of said interfacing sealing surfaces to prevent passage of unscreened liquid from said delivery channel into said holding tank,

the improvement wherein said wiping seal comprises:

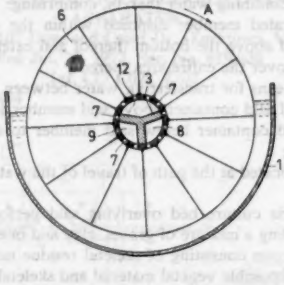
(d) a tubular body of trapezoidal section and having converging larger and smaller sides such that the larger sides pivot and the smaller sides cooperatively bow outwardly to compensate for variations in the annular space between the sealing surfaces, said body defining a distribution chamber and having a series of ports leading from said distribution chamber into an annular groove to be recited;
(e) spaced, wiping flanges extending from said two sides and defining an annular groove therebetween, said wiping flanges normally being in wiping engagement with the one of said interfacing sealing surfaces on which said wiping seal is not mounted; and
(f) means for supplying screened liquid or its equivalent to said distribution chamber at a pressure which prevents liquid from passing said seal where one or the other or both of said wiping flanges are not in wiping engagement with said one of said interfacing sealing surfaces.

4,123,363

DISK FILTER

Ensio Koskinen, Savonlinna, Finland, assignor to Enso-Gutzeit Osakeyhtio, Helsinki, Finland

Filed Jun. 29, 1977, Ser. No. 811,206
Claims priority, application Finland, Jul. 2, 1976, 761930
Int. Cl.[2] B01D *33/08*
U.S. Cl. 210—331 **2 Claims**



1. Filter apparatus for filtering a liquid comprising: tank means containing therein a liquid to be filtered; an elongated hollow shaft rotatably mounted on said tank means; a plurality of disk filters arranged on said hollow shaft at spaced intervals along the length thereof and affixed to said hollow shaft for rotation therewith, said disk filters essentially comprising a generally circular configuration having said hollow shaft extending through the central portion thereof, said disk filters being arranged to be at least partially submerged in the liquid contained in said tank means for passage therethrough upon rotation of said shaft; means on said disk filters defining hollow filtration sectors extending radially from said hollow shaft to

the periphery of each of said disk filters, each of said hollow sectors having radially extending opposed filtration faces through which liquid may pass into said filtration sectors, each of said filtration faces being defined by filter material operative to filter particulate matter from liquid passing therethrough into said filtration sectors; means defining flow holes in said shaft to place said hollow filtration sectors in flow communication with the hollow interior of said shaft; a slide member having a generally Y-shaped sectional configuration and extending longitudinally along said shaft within the hollow interior thereof, said slide member being affixed relative to said tank means and arranged to have said shaft rotate relative thereto; said slide member thereby defining the interior of said shaft into three interior chambers each adapted to be placed in flow communication with said filtration sectors through said flow holes upon rotation of said shaft relative to said slide member; a pair of end plates located on opposite ends of said shaft closing off said three interior chambers, with said three interior chambers thus extending continuously between said pair of end plates; and vacuum means connected to two of said interior chambers through at least one of said end plates to create a suction effect in said two chambers to draw liquid from said tank means through said filtration faces and into said two interior chambers to effect filtration thereof.

4,123,364

CYCLONE CONSTRUCTION AND FIXING

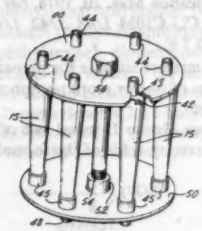
Richard H. Mozley, Falmouth, England, assignor to National Research Development Corporation, London, England

Filed Mar. 28, 1977, Ser. No. 782,295

Claims priority, application United Kingdom, Apr. 2, 1976, 13527/76

Int. Cl.² B04C 5/28

U.S. Cl. 210—512 M **10 Claims**



1. A kit of parts for assembly to form a cyclone, said kit comprising:

an apex nozzle; said apex nozzle including an annular body having an axially outwardly projecting, flexible spigot; a throughbore extending axially through the annular body and flexible spigot; and an annular skirt formed integrally on said body, said skirt circumferentially surrounding said flexible spigot, with radial spacing therefrom, and extending axially somewhat further than said flexible spigot;

an internally frusto-conical tubular member having a narrower end capable of sealing engagement with the apex nozzle when these two parts are pressed together axially;

a feed head, comprising:

means providing a tangential inlet, and

an axially extending tube;

the axially extending tube being capable of sealing engagement with said tubular member when the tubular member and feed head are pressed together axially,

such that when the apex nozzle, tubular member and feed head are all serially pressed together, these three parts together can function as a cyclone,

the throughbore of the annular body frustoconically tapering so as to have a portion contiguous with said internally frusto-conical tubular member and which forms a substantially continuous internal extension thereof when these two parts are pressed together axially.

3. A cyclone assembly, comprising:

(a) a plurality of individual cyclones, arranged in a ring each comprising:

(i) an apex nozzle including a throughbore;

(ii) an internally frusto-conical tubular member having a narrower end and a wider end, the narrower end being in engagement with said apex nozzle; and

(iii) a feed head, including: means providing a tangential inlet; and an axially extending tube, the axially extending tube being in engagement with the wider end of said tubular member;

(b) two opposite end plates, one bearing against all the apex nozzles and the other bearing against all the feed head; and

(c) connector means bearing against both opposite end plates and applying pressure thereto in a sense to draw the respective apex nozzles, internally frusto-conical members and feed heads axially together and to maintain respectively sealed communication from the respective of said tangential inlets, through the respective of said axially extending tube and the respective of said internally frusto-conical members to the respective of said throughbores of the respective of said apex nozzles said connector means being constituted by a single, tightenable rod member extending between said end plates within the ring.

4,123,365

OIL-WATER SEPARATOR

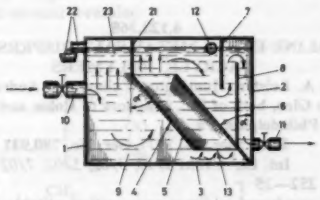
Cornelis G. Middelbeek, Nootdorp, Netherlands, assignor to Ballast-Nedam Groep N.V. and Skimovex B.V., both of Nootdorp, Netherlands

Continuation of Ser. No. 603,810, Aug. 12, 1975, abandoned. This application Aug. 25, 1977, Ser. No. 827,723

Claims priority, application Netherlands, Aug. 14, 1974, 7410902

Int. Cl.² B01D 21/10

U.S. Cl. 210—521 **2 Claims**



1. A separating device for separating substances from a liquid to be purified, said separating device comprising:

a tank having substantially vertical outer walls, a bottom, and a substantially vertical inner wall spaced horizontally from one of said outer walls;

a separator in said tank, said separator comprising two parallel inclined plates spaced from each other, the one of said plates closest to said one outer wall being connected at its upper end to said vertical inner wall;

a first outlet in the tank for the purified liquid;

an overflow between the first outlet and the separator;

a second outlet above the separator for the separated light substances, said second outlet being between said separator and said overflow;

an inlet in said one outer wall of said tank for the liquid to be purified;

said one outer wall of the tank defining with said inner wall and the one of said two parallel plates closest to said one wall a space therebetween to substantially eliminate turbulence of the liquid to be purified before entering the separator, said space including a portion between said one

outer wall and said one of said two parallel plates closest thereto of increasing cross-section with increasing depth;

a third outlet from said space for substances to be separated that are lighter than the purified liquid, said third outlet being from the upper end of the space; and

the other one of said two parallel plates extends from a region adjacent another outer wall of said tank opposite said one wall.

4,123,366

DRILLING MUD CONTAINING SODIUM CARBOXYMETHYLCELLULOSE AND SODIUM CARBOXYMETHYL STARCH

Charles A. Sauber, and Louis E. Roper, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 3, 1977, Ser. No. 821,369
Int. Cl.[2] C09K *7/02*
U.S. Cl. 252—8.5 A **2 Claims**

1. A clay-based drilling mud composed with seawater containing as additive therein to provide a low fluid loss and improved flow properties sodium carboxymethyl starch and sodium carboxymethylcellulose wherein said additives are respectively present in a weight ratio of from about 3:2 to about 19:1.

4,123,367

METHOD OF REDUCING DRAG AND ROTATING TORQUE IN THE ROTARY DRILLING OF OIL AND GAS WELLS

Anita A. Dodd, 445 The Main Bldg., Houston, Tex. 77002

Filed Apr. 29, 1977, Ser. No. 791,425
Int. Cl.[2] C09K *7/04, 7/06*
U.S. Cl. 252—8.5 B **3 Claims**

1. A method of reducing torque and drag in a wellbore having drilling fluid therein, including the addition of quantities of solid minute spherical glass beads without gas inclusions to the drilling fluid, such glass beads having a particle size of 88 to 44 microns and a hardness of 5.5 on the Moh's scale.

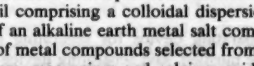
4,123,368

ALKALINE EARTH METAL SALT DISPERSIONS IN ACRYLIC POLYMERS

Norman A. Leister, Huntington Valley, and Andrew Neuman, Maple Glen, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 24, 1977, Ser. No. 780,931
Int. Cl.[2] C10M *1/10, 3/02, 5/02, 7/02*
U.S. Cl. 252—25 **18 Claims**

1. An overbased additive composition suitable for addition to a lubricating oil comprising a colloidal dispersion of (a) 1 part to 10 parts of an alkaline earth metal salt comprising the reaction product of metal compounds selected from the group consisting of barium, magnesium and calcium oxides and hydroxides with acidic gases selected from the group consisting of carbon dioxide, sulfur dioxide, sulfur trioxide, hydrogen chloride, nitrogen dioxide, and hydrogen sulfide in (b) 99 parts to 90 parts of an oil-soluble acrylic polymer which is polymerized from a monomer system of at least one alkyl or hetero-substituted alkyl ester of an acrylic monomer selected from the group consisting of methacrylates and acrylates represented by the formula



wherein R^1 is a $-CH_3$ or $-H$ radical and R^2 is a C_{1-30} alkyl, or hetero-substituted alkyl, radical or a mixture thereof, said ester or mixture of esters having an R^2 radical containing a sufficient number of carbon atoms to render the polymer oil-soluble.

11. A finished lubricating oil composition comprising (a) 1 part to 15 parts of the overbased additive of claim 1 blended with (b) 99 parts to 85 parts of a lubricating oil composition which comprises greater than 50% up to and including 100% by weight of a lubricating oil base selected from the group consisting of mineral lubricating oils including petroleum distillate oils and oils derived from paraffinic, naphthenic, asphaltic, and mixed base crude oils, and of synthetic oils including hydrocarbons, halogenated hydrocarbons, dibasic acid esters, carbonate esters, poly silicones, phosphate esters, poly glycols, and glycol esters.

4,123,369

LUBRICATING OIL COMPOSITION

Edsel L. Miller, and Robert A. Krenowicz, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Dec. 1, 1976, Ser. No. 746,284
Int. Cl.[2] C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **4 Claims**

1. In a crankcase lubricating oil composition consisting of a base oil and an additive package, the improvement wherein the composition contains from 0.2 to 1.2 percent by weight active ingredient of overbased magnesium sulfonate having a base number of about 400 and from 0.2 to 2.0 percent by weight active ingredient of slightly overbased calcium phosphonate-phenate sulfide, and the ratio of magnesium sulfonate to calcium phosphonate-phenate sulfide is from 0.5:1 to 1.5:1.

4,123,370

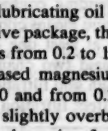
PREPARATION AND USE OF BASIC METAL SALT COMPOSITIONS OF PHOSPHORUS-CONTAINING ACIDS

Norman A. Meinhardt, Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Division of Ser. No. 798,738, May 19, 1977, Pat. No. 4,089,793.
This application Mar. 20, 1978, Ser. No. 890,563
Int. Cl.[2] C10M *1/48, 3/42, 1/44, 3/38*
U.S. Cl. 252—32.7 E **44 Claims**

1. A reaction mixture suitable for preparation of basic metal salt compositions of one or more phosphorus-containing acids which comprises:

(A) at least one Group II metal salt of one or more phosphorus-containing acids of the formula



(I)

wherein each X and X' are independently oxygen or divalent sulfur with the proviso that each *n* may be zero or one, each R is independently the same or a different hydrocarbon-based radical and the Group II metal has an atomic weight between about 24 and about 115; and

(B) at least one basically reacting alkali metal compound; wherein the equivalent ratio of the acid of (A) : (B) in the reaction mixture is sufficient to form a basic or a more basic metal salt of (A).

4,123,371

PROCESS FOR PREPARING OVER-BASED SULFURIZED ALKALINE EARTH METAL PHENATES

Takashi Hori, and Suetou Hayashida, both of Soka, Japan, assignors to Maruzen Oil Co., Ltd., Osaka, Japan

Filed Dec. 21, 1977, Ser. No. 862,809
Claims priority, application Japan, Dec. 29, 1976, 51-160376
Int. Cl.[2] C10M *1/54, 3/48, 5/28, 7/52*
U.S. Cl. 252—42.7 **9 Claims**

1. A process for preparing an over-based sulfurized alkaline earth metal phenate which comprises reacting a phenol; sulfur; and an alkaline earth metal oxide or hydroxide; in the presence

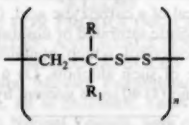
of a dihydric alcohol, with the gram equivalent ratio of the alkaline earth metal oxide or hydroxide per phenolic hydroxyl group of the phenol being maintained at about 0.99 to about 0.001, to obtain a reaction product and then reacting the reaction product with carbon dioxide at a temperature of about 50° to about 230° C.

4,123,372
LUBRICANT COMPOSITIONS CONTAINING ANTIOXIDANTS

Robert F. Bridger, Hopewell, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,570
Int. Cl.² C10M *1/38, 3/32, 5/22*
U.S. Cl. 252—48.2 **14 Claims**

1. A composition comprising a major proportion of an organic medium normally susceptible to oxidation wherein the organic medium is selected from the group consisting of oils of lubricating viscosity and greases prepared therefrom, and a minor proportion sufficient to impart antioxidant properties thereto of a mixture soluble therein comprising a polydisulfide having at least one unit therein with the following general structure:



where *n* is from 2 to about 20 and R and R_1 are hydrogen or C_1–C_{10} alkyl; and a compound selected from the group consisting of arylamines and hindered phenols wherein the arylamine is selected from N-phenyl-1-naphthylamine; N-phenyl-2-naphthylamine; 4,4′-thiobis[N-phenyl-1-naphthylamine]; 1,1′-thiobis[N-phenyl-2-naphthylamine]; diphenylamine, dinaphthylamine and phenothiazine and wherein the hindered phenol is selected from 2,6-di-t-butyl-p-cresol; 2,2′-methylenebis(2,6-di-t-butyl-p-cresol) 2,2′-methylenebis(2,6-t-butyl-m-cresol; 4,4′-butylidine-bis(6-t-butyl-m-cresol); 4,4′-methylenebis(2,6-di-t-butylphenol); 2,6-di-t-butyl-p-phenol and 4,4′-butylidinebis(6-t-butylphenol).

4,123,373
LACTONE POLYOL ESTERS AS OLEAGINOUS ADDITIVES

Stanley J. Brois, Westfield, and Antonio Gutierrez, Hamilton Square, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 14, 1977, Ser. No. 768,265
Int. Cl.² C07D *307/32;* C10M *1/28*
U.S. Cl. 252—48.6 **16 Claims**

1. An oil-soluble reaction product comprising principally lactone polyol ester having at least one hydroxy moiety, obtained from heating together a mixture of hydrocarbon-substituted lactone acid material and a polyol having 2–8 hydroxy groups and containing a total of 2 to 20 carbons, at a temperature of from about 100°–240° C. until esterification is complete by infrared analysis and/or cessation of water evolution, wherein said lactone acid material is obtained by lactonization of alkenyl succinic anhydride containing a total of 8 to 400 carbon atoms by intramolecular cyclization.

10. A lubricating oil composition comprising: a major amount of lubricating oil and 0.01 to 20 wt. % of an oil-soluble reaction product comprising principally lactone polyol ester having at least one hydroxy moiety obtained from heating together a mixture of an oil-soluble hydrocarbon substituted lactone acid material and a polyol having 2 to 8 hydroxy groups and containing a total of 2 to 20 carbons at a temperature of from 100°–240° C. until esterification is complete by infrared analysis and/or cessation of water evolution indicating completion of the esterification reaction, wherein said lactone acid material is obtained by lactonization of alkenyl succinic anhydride containing a total of 8 to 400 carbon atoms by intramolecular cyclization.

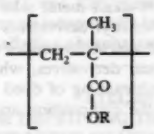
4,123,374
ELECTROPHORETIC DEVELOPMENT

Yvan K. Gilliams, Hever; Noël J. De Volder, Edegem; Walter F. De Winter, 's-Gravenwezel, and Bernard H. Tavernier, Edegem, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

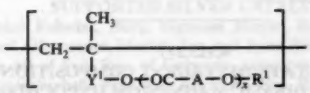
Filed Jan. 19, 1977, Ser. No. 760,516
Claims priority, application United Kingdom, Jan. 23, 1976, 2699/76
Int. Cl.² G03G *9/12*
U.S. Cl. 252—62.1 L **12 Claims**

1. A liquid developer composition for use in developing electrostatic charge patterns, which composition contains in an electrically insulating carrier liquid having a volume resistivity of at least 10^9 Ohm.cm and a dielectric constant below 3, a dispersed particulate colouring substance bearing at least one charge control substance and an organic polymeric material, wherein said polymeric material is a copolymer containing recurring units in the amount of at least about 49% by weight of B or C, a sufficient amount of A to adsorb the copolymer upon said dispersed particulate colouring substance, and up to about 2% by weight of D, wherein said units A–D have the following structural formulae:

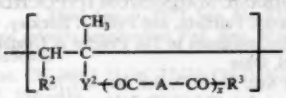
(A)



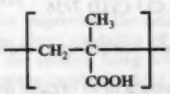
(B)



(C)



(D)



wherein:

R represents an alkyl group of 1 to 4 carbon atoms,
R^1 represents a hydrogen or an acyl group,
R^2 represents hydrogen or carboxyl in free acid or salt form,
R^3 represents hydroxyl or an ether group,
A represents an alkylene chain of 12 to 20 carbon atoms,
Y^1 represents —CO—O—CH_2—CHOH—CH_2—,
Y^2 represents —CO—, and
x represents 4 to 20.

4,123,375

DISHWASHER DETERGENT WITH CLEAR RINSING EFFECT AND METHOD OF MACHINE WASHING DISHES

Theodor Altenschöpfer, Dusseldorf-Holthausen, and Albertus van Wageningen, Erkrath-Unterbach, both of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Filed Nov. 19, 1976, Ser. No. 743,472

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552506

Int. Cl.[2] A47L *15/02;* C11D *3/20, 3/395, 7/56*

U.S. Cl. 252—99 1 Claim

1. A powdered dishwasher detergent with a clear rinsing effect consisting essentially of 40% by weight of sodium tripolyphosphate, 40% by weight of sodium metasilicate, 5% by weight of a compound releasing active chlorine in aqueous solution, 5% of low-sudsing nonionic surface active compounds were the suds level of the low-sudsing nonionic surface-active compounds according to DIN 53,902 is from 10 to 80 ml of 50° C, 7% by weight of anhydrous trisodium citrate, and 3% by weight of sodium acetate.

4,123,376

PEROXYMONOSULFATE-BASE BLEACHING AND BLEACHING DETERGENT COMPOSITIONS

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 391,058, Aug. 24, 1973, Pat. No. 4,028,263. This application Jul. 6, 1976, Ser. No. 702,395

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

Int. Cl.[2] C11D *7/56*

U.S. Cl. 252—99 10 Claims

1. A bleaching composition consisting essentially of about 5 to 25 parts by weight of a water soluble peroxymonosulfate bleach, about 3 to 20 parts by weight of a water soluble inorganic bromide, in sufficient quantity to promote the bleaching activity of the peroxymonosulfate and about 2 to 30 parts by weight of an aromatic sulfonamide compound selected from the group consisting of benzene sulfonamide, toluene sulfonamide, ethylbenzene sulfonamide, dodecylbenzene sulfonamide and xylene sulfonamide, N-alkali metal salts of said sulfonamides, N-acetyl and N-benzoyl derivatives of said sulfonamides and of said salts of said sulfonamides and mixtures of such sulfonamides, salts and derivatives, which inhibits destruction of dyes and overbleaching of dyed materials while stains to be bleached by the composition are effectively removed from substrates.

4,123,377

PARTICULATE DETERGENT COMPOSITION CONTAINING DIBASIC MAGNESIUM HYPOCHLORITE

Christopher R. Davey, Fairfield, and Peter J. Buckley, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 25, 1977, Ser. No. 827,759

Int. Cl.[2] C11D *7/56*

U.S. Cl. 252—103 27 Claims

1. A particulate detergent composition consisting essentially of

(a) from 5 to 50% by weight of an organic detergent surfactant;

(b) from 0 to 90% by weight of a detergency builder and mixtures thereof;

(c) from 1 to 50% by weight of the bleaching agent dibasic magnesium hypochlorite having an average particle diameter of less than about 88 microns; and

(d) from 0 to about 50% of a buffering agent, there being at least 1% of said buffering agent where the dibasic magnesium hypochlorite particle diameter is greater than about 45μm to give compositions having a pH of from about 8.0 to about 9.6 when added to water at a concentration of 1500 parts per million detergent.

4,123,378

STAIN REMOVING AGENTS AND PROCESS FOR CLEANING AND OPTIONALLY DYEING TEXTILE MATERIAL

Heinz Abel, and Alfred Berger, both of Reinach, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

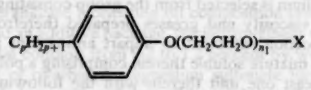
Filed Aug. 26, 1976, Ser. No. 717,976

Claims priority, application Switzerland, Sep. 16, 1975, 12011/75; Apr. 30, 1976, 5448/76

Int. Cl.[2] C11D *1/22, 1/29, 3/43;* D06P *5/00*

U.S. Cl. 252—171 5 Claims

1. A stain removing composition, which consists essentially of (1) 20 to 30 percent by weight of an anionic surfactant of the formula



wherein p is an integer from 8 to 12, n_1 is an integer of 1 to 50 and X is the acid radical of an inorganic acid which contains oxygen or the radical of a carboxylic acid, (2) 6 to 20 percent by weight of an aliphatic saturated or unsaturated, branched or straight-chain monoalcohol which contains 8 to 18 carbon atoms or a mixture of such alcohols, (3) 6 to 20 percent by weight of pine oil and (4) 40 to 68 percent by weight of water.

4,123,379

PRODUCTION OF VERY STRONGLY ACIDIC SOLIDS FOR HYDROCARBON CONVERSIONS

Bruce C. Gates, Newark, Del.; Vincent L. Magnotta, Whitehall, Pa., and George C. A. Schuit, Neunen, Netherlands, assignors to University of Delaware, Newark, Del.

Filed May 4, 1977, Ser. No. 793,780

Int. Cl.[2] B01J *31/10*

U.S. Cl. 252—184 7 Claims

1. A process for production of a very strongly acidic solid which comprises reacting aluminum trichloride with the sulfonic acid groups of a porous solid having sulfonic acid groups and ion-exchange properties, to produce hydrogen chloride and a solid acidic compound having a sulfur to aluminum to chlorine atomic ratio of about 2:1:2 in the reacted groups.

4,123,380

WASTE DISPOSAL

Karl T. Norell, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Apr. 4, 1977, Ser. No. 784,305

Claims priority, application Sweden, Apr. 2, 1976, 7603924; Apr. 2, 1976, 7603925

Int. Cl.[2] G21F *9/08*

U.S. Cl. 252—301.1 W 21 Claims

1. A method of transferring the solid constituents from aqueous waste containing low and/or medium active radioactive solid constituents into solid units intended for longtime depositing wherein said solid constituents contain ion-exchange masses which comprises:

(A) conveying said aqueous waste to a container provided with a stirrer;

(B) adding an organic compound which forms an azeotrope with water to said aqueous waste;

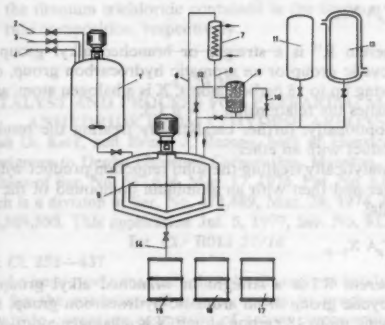
(C) distilling off said azeotrope and continuing the distilling until most or all of the water has been removed;

(D) during the distillation returning said organic compound to said aqueous waste after the water portion of said azeotrope has been removed;

(E) adding while stirring a substance which subsequently

either through hardening or reaction with another substance is transformable into a solid state;

(F) distilling off most or all of said organic compound;



(G) pouring the waste from said container into a vessel for transformation into solid units for subsequent deposition.

4,123,381

PROCESS FOR PRODUCING CELLULOSE MICROCAPSULES, AND RESULTING CELLULOSE MICROCAPSULES

Masataka Morishita; Mitsuru Fukushima; Tutomu Sasagawa; Yoshihito Inaba, all of Shizuoka; Yasuo Yokokawa, Tokyo; Satoshi Araragi; Narumi Yoshida, both of Nobeoka, and Hachiro Uchiyama, Moriyama, all of Japan, assignors to Toyo Jozo Company, Ltd. and Asahi Kasei Kogyo Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 560,936, Mar. 21, 1975, abandoned. This application Feb. 8, 1977, Ser. No. 766,729

Claims priority, application Japan, Feb. 20, 1975, 50-20381

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **10 Claims**

1. A process for producing an adsorbing cellulose microcapsule having an outer diameter of from 100 to 5000 microns and consisting of an outer semipermeable barrier layer of continuous solid phase cellulose having a thickness of from 0.5 to 5 microns and containing micropores of about 10 to 80 angstroms in diameter and adsorbent powders dispersed within a cellulose gel matrix innerside said barrier layer, which comprises dispersing said adsorbent powders in a solution of cellulose dissolved in a solvent which is not adversely affected by the adsorbing capacity of the adsorbent powders and which is selected from the group consisting of a cellulose xanthate solution and a cellulose cuprammonium solution, said cellulose xanthate solution being a viscose prepared by adding 10 to 50% (W/V) of carbon disulfide to alkali cellulose and said cellulose cuprammonium solution being a copper tetramine hydroxide solution containing 2 to 7% (W/V) of copper, 5 to 15% (W/V) of ammonia and 5 to 15% (W/V) of cellulose, then forming the resulting dispersion into droplets and finally effecting precipitation of cellulose on the droplets, each of said droplets forming a cellulose microcapsule.

10. An adsorbing cellulose microcapsule produced by the process of claim **1**.

4,123,382

METHOD OF MICROENCAPSULATION

Lewis D. Morse, Princeton; William G. Walker, Avenel, and Paul A. Hammes, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 25, 1973, Ser. No. 364,223

Int. Cl.[2] B01J *13/02;* **A61K** *9/50*

U.S. Cl. 252—316 **6 Claims**

1. A process for producing microencapsulated solid products which comprises introducing said solid products in a finely divided state to soft blank microcapsules formed from an encapsulating material selected from the group consisting of ethylcellulose, methylcellulose, hydroxypropylmethylcellulose, polyvinyl alcohol, cellulose acetate phthallate, gelatin, gum arabic and carageenan alginates in a solvent medium, hardening said soft microcapsules after said solid products have entered said microcapsules, and recovering the microencapsulated product from the resultant mixture.

4,123,383

SILICA BASED DEFOAMER COMPOSITIONS HAVING IMPROVED STABILITY

Frederick J. Ihde, Jr., Mountain Lakes, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Sep. 19, 1977, Ser. No. 834,163

Int. Cl.[2] B01D *19/04*

U.S. Cl. 252—321 **30 Claims**

1. In an aqueous system defoamer composition containing from about 2 to about 20% by weight of hydrophobic silica suspended in a liquid carrier, the improvement consisting essentially of addition of an effective amount of oil soluble resin and optionally an aliphatic acid having from about 8 to about 22 carbon atoms sufficient to stabilize and inhibit settling of the silica suspended in the liquid carrier.

4,123,384

CONTROL SERUM CONTAINING ALKALINE PHOSPHATASE OF CONSTANT ACTIVITY

Dieter Hundt, Percha, über Starnberg; Wolfgang Gruber, Tutzing-Unterzeismering; Michael Klarwein, Garmisch-Partenkirchen, and Peter Roeschlau, Seeshaupt, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Filed Aug. 16, 1976, Ser. No. 715,021

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1975, 2537127

Int. Cl.[2] C09K *3/00;* **G01N** *31/14, 33/16*

U.S. Cl. 252—408 **16 Claims**

10. Aqueous control solution having substantially stabilized alkaline phosphatase activity comprising a predetermined amount of alkaline phosphatase in an aqueous solution and at least one of Mn^{2+} and Cd^{2+} ions dissolved therein, in an amount sufficient to substantially improve the stability of the activity of said alkaline phosphatase therein.

4,123,385

PROCESS FOR IMPROVING THE ACTIVITY OF USED SUPPORTED SILVER CATALYSTS

Siegfried Rebsdat, Burg; Sigmund Mayer, Burgkirchen, Alz; Josef Alfranseder, Marktl, Inn, and Josef Riedl, Burgkirchen, Alz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 9, 1977, Ser. No. 823,032

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1976, 2636680

Int. Cl.[2] B01J *23/96, 23/50;* **C07D** *301/10, 303/04*

U.S. Cl. 252—414 **11 Claims**

1. Process for improving the activity of supported silver catalysts for the direct oxidation of ethylene with molecular oxygen or air, the catalyst being arranged as a fixed bed, by applying an average caesium and/or rubidium content of 20 to 1.000 parts per 1 million parts of catalyst to the catalyst, which has already been used for the direct oxidation, with an impregnating liquid which contains caesium compounds and/or rubidium compounds, wherein the application is carried out so that a concentration gradient from 0.5 to 20 parts of caesium and/or rubidium per 1 million parts of catalyst per meter of fixed bed is produced, so that the concentration gradient increases in the direction of flow of the gases to be reacted.

2. Process according to claim **1**, wherein several separate portions of the silver catalyst are wetted with impregnating liquids which have concentrations, which are different from

one another, within a range from 0.003 to 0.6% by weight relative to the total impregnating liquid of caesium and/or rubidium in the form of at least one dissolved or dispersed chemical compound in at least one organic solvent which is inert towards the catalyst, optionally with the addition of water, each catalyst portion remaining in contact with the impregnating liquid for about 3 to 120 minutes, this liquid is then allowed to run off and the volatile constituents of the impregnating liquid which still remain on the catalyst particles are subsequently removed by warming after which the catalyst portions thus treated are arranged in the reactor so that the caesium and/or rubidium concentrations increase constantly in the direction of flow of the gases to be reacted on the catalyst.

4,123,386

CHEMICALLY REDUCING SOLIDS WHICH MAY BE APPLIED TO THE POLYMERIZATION OF OLEFINS

Michel M. Avaro, "Rendence les Esperelles" 33 Bd des Esperelles, and Pierre M. Mangin, "Le Megaran " Bd Girard Philipe, both of 13500 Martigues, France

Division of Ser. No. 595,770, Jul. 14, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 748,947

Claims priority, application France, Aug. 14, 1974, 74 28207

Int. Cl.[2] C08F *4/64, 4/68, 4/62*

U.S. Cl. 252—429 B **20 Claims**

1. A method for preparing catalysts for polymerizing olefins, comprising two successive main steps, the first step comprising the preparation of chemically reducing solids by polymerizing an olefin of the formula $ACH=CH_2$, wherein A is hydrogen or an alkyl radical containing 1 to 8 carbon atoms, in contact with solid particles of a compound of a transition metal from sub-groups IV*a*, V*a* and VI*a* of the periodic table in a lower valency state, and in the presence of an organomagnesium compound in the form of a C_1–C_{12} alkyl magnesium compound in the relative proportion such that the molar ratio of organic groups of the alkyl magnesium compound to the transition metal is 0.2–2.0/1, and the second step comprising contacting the chemically reducing solids from the first step with reducible compounds of transition metals from sub-groups IV*a*, V*a* and VI*a* of the periodic table to effect reduction thereof, terminating the polymerization in the first step when the quantity of olefin polymerized is from 50 mg.–50 g. per mg.-atom of transition metal.

4,123,387

CATALYSTS FOR POLYMERIZATION OF OLEFINS

Akinobu Shiga; Yoshiharu Fukui; Kazuhiro Matsumura; Toshio Sasaki, and Masahisa Ohkawa, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 14, 1977, Ser. No. 777,269

Claims priority, application Japan, Mar. 15, 1976, 51-28313

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B **22 Claims**

1. In a method for the production of a solid catalyst for olefin polymerization comprising preparing a titanium trichloride composition by reducing tetrachloride with an organoaluminum compound of the formula:

$$R_nA\,X_{3-n}$$

wherein R is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom or a hydrogen atom, and n satisfies the relationship $1 \leqq n \leqq 3$, at a temperature of about $-100°$ to about 60° C. to obtain a solid reduction product, and then treating the resulting solid reduction product by one of the following methods, (a), (b), (c), (d), (e) or (f):

(a) heat-treating the solid reduction product at about 100° to about 180° C. in the absence of or presence of an inert solvent,

(b) catalytically treating the solid reduction product with an aluminum compound of the formula:

$$R''_pA\,X_{3-p}$$

wherein R″ is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom, and p satisfies the relationship $1 = p$ 1.5,

and, optionally, further catalytically treating the resulting product with an ether,

(c) catalytically treating the solid reduction product with an ether and then with an aluminum compound of the formula:

$$R''_pA\,X_{3-p}$$

wherein R″ is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom, and p satisfies the relationship $1 \leqq p < 1.5$,

and, optionally, further catalytically treating the resulting product with an ether,

(d) catalytically treating the solid reduction product with an ether and then with an aluminum compound of the formula:

$$R''_pA\,X_{3-p}$$

wherein R″ is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, X is a halogen atom, and p satisfies the relationship $1 \leqq p < 1.5$,

in the presence of an organo-halogen compound of the formula:

$$R'''X$$

wherein R‴ is a straight or branched alkyl group, an alicyclic group or an aromatic hydrocarbon group, each having up to 18 carbon atoms, and X is a halogen atom, and, optionally, further catalytically treating the resulting product with an ether,

(e) catalytically treating the solid reduction product with an ether and then with an aluminum halide of the formula:

$$AlX_3$$

wherein X is a halogen atom, dissolved in an aromatic hydrocarbon in the presence of a hydrogen halide of the formula:

$$HX$$

wherein X is a halogen atom, and, optionally, further catalytically treating the resulting product with an ether,

(f) catalytically treating the solid reduction product with an ether and then with titanium tetrachloride;

the improvement comprising treating the thus produced titanium trichloride composition at a temperature of from about 0° to about 150° C. with a mixture of a halogenated hydrocarbon (1) represented by the formula

$$CH_qX_{4-q}$$

wherein X is a halogen atom and q is an integer satisfying the relationship $0 \leqq q < 4$, and an ether (2) represented by the formula

$$R_3—O—R_4$$

wherein R_3 and R_4, which may be the same or different, each is an alkyl group, an alicyclic group or an aromatic

hydrocarbon group, each having up to 10 carbon atoms, wherein the amounts of the halogenated hydrocarbon and ether used in the catalytic treating of the titanium trichloride composition are about 0.001 to about 1.0 and about 0.001 to about 5 times on a molar basis to the amount of the titanium trichloride contained in the titanium trichloride composition, respectively.

4,123,388

CATALYST AND PROCESS FOR PREPARING MALEIC ANHYDRIDE FROM C_4 HYDROCARBONS

Ralph O. Kerr, and Bruno J. Barone, both of Houston, Tex., assignors to Denka Chemical Corporation, Houston, Tex.

Division of Ser. No. 667,624, Mar. 17, 1976, Pat. No. 4,049,574, which is a division of Ser. No. 473,489, Mar. 28, 1974, Pat. No. 3,989,585. This application Jul. 5, 1977, Ser. No. 812,582

Int. Cl.[2] B01J *27/18*

U.S. Cl. 252—437 **1 Claim**

1. An improved vanadium-phosphorus-oxygen catalyst complex for the oxidation of normal butane to produce maleic anhydride consisting essentially of active components in the atom ratios vanadium 1:phosphorus 0.90 to 1.3:copper 0.005 to 0.3:Me 0.005 to 0.25 wherein Me consists essentially of Ce and further containing as an active component an alkali or alkaline earth metal in the atom ratio of 0.001 to 0.01 per atom of V.

4,123,389

PYROGENIC SILICA OR TITANIA OR ALPHA-ALUMINA CUPROUS CHLORIDE CATALYST OF HYDROGEN CHLORIDE/OXYGEN REACTION

Wim J. M. Pieters, Morristown; Emery J. Carlson, Chatham; William E. Gates, Andover, and William C. Conner, Jr., Succasunna, all of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Feb. 2, 1977, Ser. No. 765,161

Int. Cl.[2] B01J *27/06*; C07C *17/00*; B01J *27/06*

U.S. Cl. 252—441 **7 Claims**

1. An improved copper chloride/alkali metal chloride catalyst on silica, titania or alpha-alumina carrier, effective for production of chlorine or chlorination of organic material by vapor phase reaction between hydrogen chloride and elemental oxygen, which catalyst is essentially anhydrous and consists essentially of granules composed of a relatively low bulk density carrier of open structure and active catalyst; the carrier being between about 30% and about 85% by weight of the total catalyst and being silica, titania or alpha-alumina particles, which particles are non-porous and have diameters in the range of about 50 to 1000 A, and said carrier having surface area of at least about 50 square meters per gram measured by the BET method using nitrogen gas; the catalyst granules having voids within the granules such that at least 20% of the voids have radius greater than 200 A as measured by nitrogen sorption isotherms; and the surface of said granules being occupied by active catalyst composed of a first layer of copper chloride, essentially in the cuprous form, being at least about 10% by weight of the total catalyst and of a second layer of at least one alkali metal chloride, permissibly also containing at least one rare earth metal chloride, said copper chloride being the largest molecular proportion of said active ingredients and the amount of active ingredients being at least sufficient theoretically to cover the carrier particles with a coating one molecule thick.

4,123,390

ZEOLITE AGGLOMERATES HAVING CONTROLLED PORE STRUCTURE

John D. Sherman, Chappaqua, and Ronald J. Ross, Upper Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,062

Int. Cl.[2] B01J *29/06, 35/00*

U.S. Cl. 252—455 Z **5 Claims**

1. A porous rigid agglomerated body comprising zeolitic molecular sieve crystals having average diameters of from 0.5 to 15 microns and having pores large enough to adsorb carbon dioxide, said molecular sieve crystals being present in an amount of at least 6 grams and comprising at least 40 weight percent, in their activated state, of said body, said body having a piece density of at least 0.5 g./cm.^{3}, an effective thickness value of greater than 0.20 cm., a total capillary pore volume of from 0.2 to 1.0 cc./gm. in the activated state, of which from 4 to 75 percent thereof is created by macropores having average diameters of from 2 to 100 microns, and at least 10 percent thereof being created by macropores having diameters less than 1 micron.

2. A porous rigid agglomerated body according to claim 1 which comprises in addition to zeolitic molecular sieve crystals, a refractory inorganic oxide binder in an amount of 50 to 60 weight percent of the overall body in the activated state.

4,123,391

AUTO EMISSION PURIFYING CATALYST AND METHOD OF MANUFACTURE

Masaaki Noguchi, Nagoya, and Tsuchio Bunda, Okazaki, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Oct. 26, 1976, Ser. No. 735,785

Claims priority, application Japan, Oct. 23, 1975, 50-127985

Int. Cl.[2] B01J *21/04, 23/44*

U.S. Cl. 252—466 PT **10 Claims**

1. An auto emission purification catalyst, comprising:

palladium supported on an α-alumina carrier having a total pore volume of 0.05 - 0.50 cc/g and an average pore diameter of 0.05 - 5.0μ.

4,123,392

NON-COMBUSTIBLE NUCLEAR RADIATION SHIELDS WITH HIGH HYDROGEN CONTENT

William C. Hall, Central Valley, and John M. Peterson, Rock Tavern, both of N.Y., assignors to Chemtree Corporation, Central Valley, N.Y.

Continuation-in-part of Ser. No. 243,825, Apr. 13, 1972, abandoned. This application Jun. 14, 1976, Ser. No. 695,378

Int. Cl.[2] C09K *3/00*

U.S. Cl. 252—478 **22 Claims**

1. A method comprising attenuating nuclear radiation by intercepting the radiation with a non-combustible, self supporting system formed of a continuous phase of fire resistant cementitious material and in which is dispersed a discontinuous phase, said discontinuous phase containing hydrogen atoms in the form of a rigid, combustible organic plastic or resin with a particle size distribution such that no more than 10 percent of said discontinuous phase passes a 150 mesh screen and with a volume percent range of said continuous phase between about 40 percent and about 98 percent of the total shield volume.

21. A self-supporting, non-combustible, nuclear radiation shielding composition comprising a continuous phase of fire resistant cementitious material and a discontinuous phase dispersed therein, said discontinuous phase containing hydrogen atoms in the form of a rigid, combustible, organic plastic or resin with a particle size distribution such that no more than 10 percent of said discontinuous phase passes a 150 mesh screen and with a volume percent range of said continuous phase between about 40 percent and about 98 percent of the total shield volume, said continuous phase being adapted to retain its shape in the presence of a temperature adapted to soften, melt or decompose the discontinuous phase, said composition further comprising a further material dispersed in the continuous phase and including a substance containing at least one enriched isotope of an element in a ratio different from that present in natural abundance.

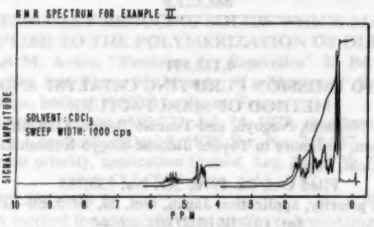
4,123,393
SUBSTITUTED-NORBORNANE PERFUME COMPOSITIONS

Kenneth K. Light, Long Branch; James M. Sanders, Eatontown; Manfred H. Vock, Locust, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin Vinals, Red Bank, N.J.; William L. Schreiber, Jackson, N.J.; John B. Hall, Rumson, N.J.; Denis E. Hruza, Sr., Bricktown, N.J.; Venkatesh Kamath, Red Bank, N.J.; Braja D. Mookherjee, Holmdel, N.J.; Ching Y. Tseng, Middletown, N.J., and Mark A. Sprecker, Sea Bright, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 765,847, Feb. 4, 1977, Pat. No. 4,076,853. This application Dec. 13, 1977, Ser. No. 860,133

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 22 Claims



1. A perfume composition comprising one or more norbornane derivatives having the structure:

wherein R is C_3–C_5 alkenyl or C_3–C_5 alkylidene and the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond and at least one adjuvant selected from the group consisting of natural perfume oil, synthetic perfume oil, alcohols, aldehydes, ketones other than said norbornane derivatives, nitriles, esters and lactones.

4,123,394
TRICYCLO[5.2.1.0^{2,6}]DECANE-METHYLOL OR ITS LOWER ALKYL OR ALKENYL ESTER OR ETHER DERIVATIVES IN PERFUME COMPOSITIONS

Werner Skorianetz, Dardagny; Khurshid P. Dastur, Satigny, and Hugo Strickler, Dardagny, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

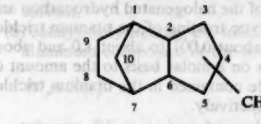
Filed Dec. 1, 1976, Ser. No. 746,211

Claims priority, application Switzerland, Dec. 8, 1975, 15897/75

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 8 Claims

1. A process for preparing perfume compositions comprising the step of admixing a fragrance-imparting amount of a compound of formula



(I)

wherein:

symbol R^1 represents a lower saturated or unsaturated linear or branched alkyl radical, having from 1 to 6 carbon atoms, an acyl radical containing from 1 to 6 carbon atoms or a hydrogen atom, and

the side-chain is bound to cyclopentane ring at positions 4 or 5 of the said ring;

to confer a flowery, fruity or woody note to such perfume compositions.

4,123,395
COMPOSITIONS CONTAINING NONIONIC SURFACTANT AND SULFONATED AROMATIC COMPATIBILIZING AGENT

Edward J. Maguire, Jr., and Robert A. Staab, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 635,831, Nov. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 479,953, Jun. 17, 1974, abandoned. This application Sep. 28, 1977, Ser. No. 837,343

Int. Cl.[2] C11D *3/34, 1/831, 1/83*

U.S. Cl. 252—559 31 Claims

1. A cleaning composition, particularly suitable for use in automatic dishwashers and having improved antiredeposition properties, comprising:

(a) at least about 4% by weight of an alkoxylated low-foaming nonionic surface-active agent, wherein said nonionic surface-active agent is selected from the group consisting of a condensation product of one mole tallow alcohol with from about 6 to about 20 moles of ethylene oxide; an alkoxylate having the formula

$$Y[(C_3H_6O)_n(C_2H_4O)_mH]_x$$

wherein x has a value of at least about 2, n has a value such that the molecular weight of the polyoxypropylene hydrophobic base is at least about 900 and m has a value such that the oxyethylene content of the molecule is from about 10% to about 90% by weight, and wherein Y is selected from the group consisting of propylene glycol, glycerine, pentaerythritol, trimethylolpropane, ethylene diamine and mixtures thereof; a polyetherester having the formula

$$(ClC_6H_4)_2CHCO_2(CH_2CH_2O)_xR$$

wherein x is an integer from 4 to 20 and R is a lower alkyl group containing not more than 4 carbon atoms; a surfactant having the formula

$$Y(C_3H_6O)_n(C_2H_4O)_mH$$

wherein Y is the residue of an organic compound having from about 1 to 6 carbon atoms and one reactive hydrogen atom, n has an average of at least about 6.4, as determined by hydroxyl number, and m has a value such that the oxyethylene portion constitutes about 10 to 90 weight percent of the molecule; a surfactant having the formula

$$P[(C_3H_6O)_n(C_2H_4O)_mH]_x$$

wherein P is the residue of an organic compound having from about 8 to 18 carbon atoms and containing x reactive hydrogen atoms in which x has a value of 1 or 2, n has a value such that the molecular weight of the polyoxypropylene portion is at least about 58 and m has a value such

that the oxyethylene content of the molecule is from about 10 to 90 weight percent; a surfactant having the formula

$$P[(C_2H_4O)_x(C_3H_6O)_mH]_x$$

wherein P is the residue of an organic compound having from about 8 to 18 carbon atoms and containing x reactive hydrogen atoms in which x has a value of 1 or 2, n has a value such that the molecular weight of the polyoxyethylene portion is at least about 44 and m has a value such that the oxypropylene content of the molecule is from about 10 to 90 weight percent; a condensation product of benzyl chloride and an ethoxylated alkyl phenol wherein the alkyl group has from about 6 to about 12 carbon atoms and wherein from about 12 to about 20 ethylene oxide molecules have been condensed per mole of alkyl phenol; and mixtures of the foregoing surfactants; and

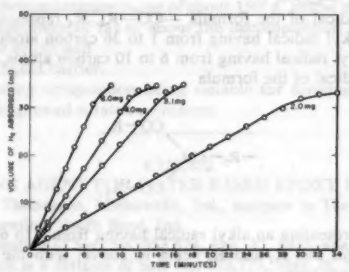
(b) at least about 5% by weight of a sulfonated aromatic compatibilizing agent having a critical micelle concentration greater than 1% by weight at 25° C., wherein the weight ratio of said alkoxylated nonionic surface-active agent to said sulfonated compatibilizing agent is in the range from about 2:5 to about 5:3, the compositions being substantially free of a chlorine bleach component and being in a form selected from the group consisting of a solid, a paste, a gel, or a non-aqueous liquid.

4,123,396

IMPREGNATED METAL-POLYMERIC FUNCTIONAL BEADS

Alan Rembaum, Altadena, and Willi Volksen, Pasadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 27, 1976, Ser. No. 718,103
Int. Cl.² C08F 8/42
U.S. Cl. 526—24 **7 Claims**



1. A metal containing polymeric microsphere composition comprising:

polymeric microspheres having a diameter below 100 microns containing at least 20% by weight of a tertiary amine substituted monomer having the amine ligand pendant from the polymer backbone selected from the group consisting of cross-linked polystyrene-divinylbenzene substituted with $—CH_2NMe_2$, polyethylene imine, polyvinylbenzimidazole and polyvinylpyridine, said ligands being capable of ionic reaction or coordination with Group IV, VI, VII, or VIII metal compounds selected from oxides, salts or acids to form complexes therewith and said microspheres containing;

at least 0.1 weight percent of finely divided, free metal associated with the amine ligands formed by reduction of the compound in situ within the microsphere by reaction with a reducing agent selected from the group consisting of borohydrides and aluminum hydrides.

4,123,397

AGGLOMERATION OF STARCH-HYDROLYZED POLYACRYLONITRILE GRAFT COPOLYMER

Duane A. Jones, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Jun. 15, 1977, Ser. No. 806,641
Int. Cl.² C08L 3/02
U.S. Cl. 260—17.4 GC **3 Claims**

1. A process of agglomerating and desolventizing starch-hydrolyzed polyacrylonitrile graft copolymer wherein said acrylonitrile is hydrolyzed to carboxamide and alkali metal carboxylate groups, comprising wetting particles of starch-hydrolyzed polyacrylonitrile copolymer during mixing with atomized, liquid water until the moisture content of the particles reaches about 17% to 22% by weight based upon the weight of the total composition and subsequently drying the particles at a temperature between about 25° C. to 100° C. to a moisture content of about 3% to 12.5% by weight of the total composition.

4,123,398

FLAME RESISTANT CELLULOSIC PRODUCT CONTAINING ANTIMONY PENTOXIDE AND POLYVINYL BROMIDE

David G. Unrau, Budd Lake; Norman A. Portnoy, Hopatcong, and Peter J. Hartmann, Dover, all of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 25, 1977, Ser. No. 800,186
Int. Cl.² C08L 1/24; D01F 2/06
U.S. Cl. 260—17.4 CL **10 Claims**

1. A flame resistant cellulosic product regenerated from a cellulosic viscose solution containing from 3 to 7% by weight of colloidal Sb_2O_5 and from 5 to 30% by weight of polyvinyl bromide, said weights being based upon the weight of cellulose.

4,123,399

PLASTICIZED, HEAT-STABILIZED PVC COMPOSITIONS

Michel Gay, Lyons, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jun. 28, 1977, Ser. No. 810,845
Claims priority, application France, Jun. 28, 1976, 76 20181; Jan. 28, 1977, 77 3086
Int. Cl.² C08K 5/09
U.S. Cl. 260—23 XA **18 Claims**

1. A composition of matter comprising (1) a vinyl chloride polymer, (2) a plasticizer therefor, and (3) heat-stabilizing amounts of (i) a mixture of metal salts of aliphatic and aromatic organic acids, (ii) a polyol having at least four hydroxyl functions, at least one of which being a primary alcohol function, and (iii) a β-diketone having the structural formula:

$$R_1 — CO — CHR_2 — CO — R_3 \quad (I)$$

wherein R_1 and R_3, which can be identical or different, represent:

a linear or branched chain alkyl or alkenyl radical having at least one and up to 36 carbon atoms,

an aralkyl radical having from 7 to 36 carbon atoms, and

an aryl or cycloaliphatic radical having fewer than 14 carbon atoms, the cycloaliphatic radicals optionally comprising carbon-to-carbon unsaturation; with the proviso that the foregoing radicals R_1 and R_3 either may or may not be substituted, and, when substituted, each said substituent is selected from the group consisting of halogen, or, in the case of the aryl or cycloaliphatic radicals, methyl or ethyl radicals; said R_1 and R_3 optionally may also be modified by the presence of one or more of the linkages —O—,

or —CO—, in an aliphatic chain; and together R_1 and R_3 can also form a divalent alkylene radical of 2 to 5 carbon atoms, optionally containing a bridging oxygen or nitrogen atom;

R_2 represents:

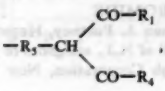
a hydrogen atom,

an alkyl or alkenyl radical, having at least one and up to 36 carbon atoms, which can contain one or more of the linkages —O—,

or —Co—,

a radical of the formula —CO—R_4, R_4 representing an alkyl radical having from 1 to 36 carbon atoms, or an aryl rdical having from 6 to 10 carbon atoms, or

a radical of the formula



R_5 representing an alkyl radical having from 1 to 6 carbon atoms, and R_1 and R_3 being as above; with the further proviso that;

for R_1 and R_3, the carbon atom bonded to the respective carbonyl function of the compound (I) is free from ethylenic or carbonyl unsaturation;

for R_1 or R_3, the carbon atom bonded to the respective carbonyl function does not comprise a moiety which includes aromatic unsaturation;

one of the radicals R_1 or R_3 can represent a hydrogen atom;

R_1 and R_2 together can represent a divalent radical selected from among the following:

a linear or branched alkylene or alkenylene radical, having up to 36 carbon atoms,

an aralkylene radical having from 7 to 36 carbon atoms, and

an arylene or cycloalkylene radical having fewer than 14 carbon atoms, the cycloaliphatic radicals optionally comprising carbon-to-carbon unsaturation;

and with the further proviso that such latter radicals too either may or may not be substituted, and, when substituted, each such substituent is selected from the group consisting of halogen, or, in the case of the aryl or cycloalphiatic radicals, methyl or ethyl radicals, and such latter radicals optionally being modified by the presence, in an aliphatic chain, of one of more of the linkages:

4,123,400

HEAT-STABILIZED PVC COMPOSITIONS

Michel Gay, Lyons, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jun. 28, 1977, Ser. No. 810,849

Claims priority, application France, Jun. 28, 1976, 76 20180

Int. Cl.[2] C08K 5/09

U.S. Cl. 260—23 XA **17 Claims**

1. A composition of matter comprising

(1) a vinyl chloride polymer, and

(2) heat-stabilizing amounts of (1) a mixture of metal salts of aliphatic and aromatic organic acids selected from the group consisting of calcium/zinc, calcium/cadmium, barium/zinc and barium/cadmium salts of aliphatic and aromatic organic acids, (ii) a polyol, and (iii) a β-diketone having the structural formula:

$$R_1 - CO - CHR_2 - CO - R_3 \quad (I)$$

wherein R_1 and R_3, which can be identical or different, represent:

a linear or branched chain alkyl or alkenyl radical having at least one and up to 36 carbon atoms,

an aralkyl radical having from 7 to 36 carbon atoms, and

an aryl or cycloaliphatic radical having fewer than 14 carbon atoms, the cycloaliphatic radicals optionally comprising carbon-to-carbon unsaturation; with the proviso that the foregoing radicals R_1 and R_3 either may or may not be substituted, and, when substituted, each said substituent is selected from the group consisting of halogen, or, in the case of the aryl or cycloaliphatic radicals, methyl or ethyl radicals; said R_1 and R_3 optionally may also be modified by the presence of one or more of the linkages —O—,

or —CO—, in an aliphatic chain; and together R_1 and R_3 can also form a divalent alkylene radical of 2 to 5 carbon atoms, optionally containing a bridging oxygen or nitrogen atom;

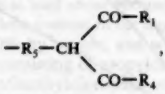
R_2 represents: a hydrogen atom,

an alkyl or alkenyl radical, having at least one and up to 36 carbon atoms, which can contain one or more of the linkages —O—,

or —CO—,

a radical of the formula —CO—R_4, R_4 representing an alkyl radical having from 1 to 36 carbon atoms, or an aryl radical having from 6 to 10 carbon atoms, or

a radical of the formula



R_5 representing an alkyl radical having from 1 to 6 carbon atoms, and R_1 and R_3 being as above; with the further proviso that;

for R_1 and R_3, the carbon atom bonded to the respective carbonyl function of the compound (I) is free from ethylenic or carbonyl unsaturation;

for R_1 or R_3, the carbon atom bonded to the respective carbonyl function does not comprise a moiety which includes aromatic unsaturation;

one of the radicals R_1 or R_3 can represent a hydrogen atom;

R_1 and R_2 together can represent a divalent radical selected from among the following:

a linear or branched alkylene or alkenylene radical, having up to 36 carbon atoms,

an aralkylene radical having from 7 to 36 carbon atoms, and

an arylene or cycloalkylene radical having fewer than 14 carbon atoms, the cycloaliphatic radicals optionally comprising carbon-to-carbon unsaturation; and with the further proviso that such latter radicals too either may or may not be substituted, and, when substituted, each such substituent is selected from the group consisting of halogen, or, in the case of the aryl or cycloaliphatic radicals, methyl or ethyl radicals, and such latter radicals option-

ally being modified by the presence, in an aliphatic chain, of one or more of the linkages:

$$-O-,\ -\underset{\underset{O}{\|}}{C}-O-,\ -CO-.$$

4,123,401

FINISHES HAVING IMPROVED SCRATCH RESISTANCE PREPARED FROM COMPOSITIONS OF FLUOROPOLYMER, MICA PARTICLES OR METAL FLAKE, A POLYMER OF MONOETHYLENICALLY UNSATURATED MONOMERS AND A LIQUID CARRIER

Jacques M. L. Berghmans, Lint, Belgium, and Eva M. Vary, Wynnewood, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 710,618, Aug. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,491, Jul. 21, 1975, abandoned. This application Feb. 2, 1978, Ser. No. 874,491

Int. Cl.² C08L *27/18*

U.S. Cl. 260—29.6 F **15 Claims**

1. A coating composition consisting essentially of

(a) about 80–99.8%, by weight of the total of (a) and (b), of a particulate polymer polymerized or copolymerized from monomers selected from one or more monoethylenically unsaturated hydrocarbon monomers and hydrocarbon ether monomers, said monomers being completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms;

(b) about 0.2–20%, by weight of the total of (a) and (b), of mica particles, mica particles coated with pigment, or metal flake;

the total of (a) and (b) equaling 100%;

(c) about 2–300%, by weight of (a), of one or more polymers of monoethylenically unsaturated monomers which depolymerize and whose depolymerization products vaporize in the temperature range of about 150° C below the fusion temperature of (a) to about the decomposition temperature of (a); and

(d) a liquid carrier,

said coating composition being suitable for forming finishes having improved scratch resistance.

4,123,402

CURING AGENT FOR WATER-BASED EPOXY RESINS

Ivar P. Thomassen, Mishawaka, Ind., assignor to The O'Brien Corporation, South Bend, Ind.

Continuation of Ser. No. 553,524, Feb. 27, 1975, abandoned, which is a division of Ser. No. 473,777, May 28, 1974, abandoned, which is a continuation of Ser. No. 307,937, Nov. 20, 1972, abandoned. This application Feb. 28, 1977, Ser. No. 773,420

Int. Cl.² C08L *63/00*; C08K *5/17*

U.S. Cl. 260—29.2 EP **11 Claims**

1. A water-dispersible or water-soluble curing agent having a pot-life of between about 2–12 hours for epoxy resins for producing a curing reaction under ambient conditions on a structural surface which curing agent comprises a mixture of water and the hyroxylated amido-poly amine terminated reaction product of an aliphatic polyepoxide, an aliphatic polyamine having at least one primary amine and a polyfunctional carboxylic acid, said amine terminated reaction product having an amine value of from about 150 to about 800, a molecular weight of from about 280 to about 1500, from two to about ten hydroxyl groups per molecule and being essentially free of unreacted carboxylic acid groups and water, said curing agent being substantially free of organic solvents, cosolvents and emulsifiers, said mixture of water and amine terminated reaction product having a pH about about 9.0.

4,123,403

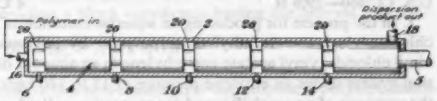
CONTINUOUS PROCESS FOR PREPARING AQUEOUS POLYMER MICROSUSPENSIONS

Gregory L. Warner, and Douglas E. Leng, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 27, 1977, Ser. No. 810,221

Int. Cl.² C08J *3/06*

U.S. Cl. 260—29.2 EP **18 Claims**



1. A continuous process for preparing aqueous polymer microsuspensions which comprises the steps of:

(a) forming a heterogeneous composition having a discontinuous aqueous phase and a continuous polymer phase by subjecting substantially all of a composition comprising a heat plastified polymer, water and an emulsifying agent to essentially the same maximum shear under conditions of laminar flow for a time sufficient to provide the dispersed polymer particles in the final aqueous polymer microsuspension with a D84/D50 particle size distribution of 1.8 or less;

(b) converting the resulting polymer-continuous heterogeneous composition to an aqueous-phase-continuous heterogeneous composition having a discontinuous polymer phase by adding an additional amount of water to such polymer-continuous composition; and

(c) cooling the aqueous-phase-continuous heterogeneous composition to below the melting point of the polymer.

4,123,404

WATER-BASED COATINGS

Edward A. Lasher, Beverly Hills, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.

Continuation of Ser. No. 576,914, May 12, 1975, abandoned, which is a division of Ser. No. 246,353, Apr. 21, 1972, abandoned. This application Jul. 25, 1977, Ser. No. 818,789

Int. Cl.² C08L *61/28*

U.S. Cl. 260—29.4 R **16 Claims**

1. A method of making a heat-curable, aqueous resin solution incorporating water-thinnable ester therein for use in making a water-insoluble coating consisting of the steps of:

admixing (1) a polyol having a hydroxyl functionality between about 3 and about 3.5 and having a carbon/oxygen ratio between about 5:3 and about 7:3 with (2) a polycarboxylic acid having from 3 to about 10 carbon atoms and having 2 to 4 carboxyl groups in an equivalents ratio of said polyol to said polycarboxylic acid of about 3:1;

heating the admixture of said polyol and polycarboxylic acid to substantially esterify said polyol and said acid to thereby produce said water-thinnable ester, said ester being selected from the group consisting of monoester, diester, triester and mixture thereof;

admixing and water-thinnable ester with (a) a water-thinnable ester with (a) a water-soluble, aminoplast resin in an amount sufficient to produce, upon curing in combination with said ester, a substantially water-insoluble, cured coating, and (b) a solvent for said ester and said aminoplast resin with water comprising at least a substantial portion of said solvent, to produce said heat-curable, resin solution.

4,123,405
PROCESS FOR PRODUCING AQUEOUS EMULSIONS OF VINYL CHLORIDE/VINYL ACETATE/ETHYLENE TERPOLYMERS

Takeo Oyamada; Kazuhisa Satoh; Choji Tomizawa, all of Ichihara, and Takamasa Ishihara, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 9, 1977, Ser. No. 805,029
Claims priority, application Japan, Jun. 17, 1976, 51/71862
Int. Cl.[2] C08L *33/00*
U.S. Cl. 260—29.6 R 4 Claims

1. In the process for producing an aqueous emulsion of vinyl chloride/vinyl acetate/ethylene terpolymer by polymerizing vinyl chloride, vinyl acetate and ethylene in an aqueous dispersion system under an ethylene pressure of 15 to 120 kg/cm^2 in the presence of an emulsifier and/or protective colloid using a radical initiator at a temperature of 30° to 70° C. while maintaining the pH of the system at 3 to 7, the process comprising a first polymerization step and a second polymerization step to give an aqueous emulsion of vinyl chloride/vinyl acetate/ethylene terpolymer comprising 30 to 70% by weight of vinyl chloride, 15 to 55% by weight of vinyl acetate and 5 to 35% by weight of ethylene, the first polymerization step comprising adding vinyl chloride and vinyl acetate to said aqueous dispersion system at substantially fixed rates while maintaining the concentration of unreacted vinyl acetate in the system in the range of 1.5 to 15% weight based on the total weight of the system, said addition of all the vinyl chloride monomer being completed in the first polymerization step and the second polymerization step comprising adding successively additional vinyl acetate of 3 to 20% by weight based on the total weight of vinyl acetate which has been added until that time in order to maintain the concentration of unreacted vinyl acetate in the aqueous system unchanged and then further continuing the polymerization until the concentration of unreacted vinyl acetate in the system is decreased to 1% by weight or less based on the total weight of the system, wherein the volume of the aqueous dispersion system is at least 50% by volume based on the volume of the reactor when addition of the additional vinyl acetate is completed.

4,123,406
METHOD OF PREPARING SHAPED ARTICLES FROM CROSS-LINKED HYDROGELS

Artur Stoy, and Renata Urbanova, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 127,375, Mar. 23, 1971, abandoned. This application Feb. 4, 1976, Ser. No. 655,208
Claims priority, application Czechoslovakia, Mar. 26, 1970, 2021/70
Int. Cl.[2] C08L *35/04*
U.S. Cl. 260—29.6 AN 1 Claim

1. A method for preparing a shaped article from a cross-linked hydrogel swellable in water and in aqueous solution, consisting of the steps of

(a) polymerizing acrylonitrile alone or with a minor amount of a monoethylenically unsaturated monomer copolymerizable therewith, in concentrated nitric acid under radical polymerization conditions without adding additional chain-transfer and cross-linking agents and in the absence of any organic dispersion medium, said monomer being used in a concentration ranging from 25 to 40% by weight, based on the weight of the total mixture, at temperatures not exceeding 40° C, in a mold without stirring to produce a lyogel,

(b) maintaining said lyogel in the presence of said concentrated nitric acid at a temperature of 0° to 50° C. until said lyogel is partially hydrolyzed to form a hydrogel having a swelling capacity of about 20 to 95% by weight of water, and

(c) removing nitric acid by washing the hydrogel in an aqueous liquid selected from the group consisting of water and water containing an alkaline substance.

4,123,407
HYDROPHILIC CONTACT LENS

Stanley I. Gordon, Rochester, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 26, 1976, Ser. No. 745,140
Int. Cl.[2] C08F *212/36;* C08L *25/02;* G02C *7/04*
U.S. Cl. 260—29.6 TA 15 Claims

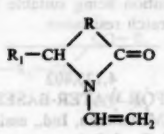
1. A shaped transparent contact lens of concave-convex shape with the concave surface substantially conforming to the cornea of the eye, said lens being formed of a hydrogel composition consisting essentially of:

(A) a polymerized water-insoluble but water-swellable polymer composition from a polymerizable mixture consisting essentially of:

(1) polymerizable monoester of an acid selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof; and a polyhydric alcohol having 2 to 6 alcohol groups and being selected from the group consisting of ethylene glycol, 1,3-propanediol, a dialkylene glycol, a polyalkylene glycol, 1,6-hexamethylene glycol, 1,4-butanediol, glycerol, trimethylol propane, trimethylolethane, pentaerythritol, mannitol, and sorbitol;

(2) monoethylenically unsaturated esters selected from the group consisting of alkyl acrylates, alkyl methacrylates, vinyl esters of saturated monocarboxylic acids of up to 22 carbon atoms, and mixtures thereof; wherein the alkyl groups of said methacrylate or acrylate contain from 1 to 22 carbon atoms;

(3) heterocyclic N-vinyl polymerizable compounds containing at least one nitrogen atom in the ring, and a carbonyl functionality adjacent to a nitrogen in the heterocyclic ring and being selected from the group consisting of vinyl lactams having the formula:



wherein R represents an alkylene bridge group of 2 to 4 carbon atoms and R_1 represents a member selected from the group of hydrogen, alkyl, aryl, aralkyl, and alkaryl groups; N-vinyl imidazolidone, N-vinyl succinimide, N-vinyl diglycolylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, and N-vinyl-5-methyl-3-morpholinone; and

(4) a divinyl compound selected from the group consisting of divinyl benzene, divinyl toluene, and mixtures thereof;

wherein said polymerizable mixture contains from about 93.8% to about 51.8% by weight of (1); from about 1 to about 6% by weight of (2); from about 5 to about 40% by weight of (3); and from about 0.2 to about 2.2% by weight of (4) based upon the total weight of (1), (2), (3), and (4) in said polymerizable mixture; and

(B) physiologically acceptable aqueous solution; wherein said hydrogel contains from about 30 to about 80% by weight of (A) based upon the total weight of (A) and (B), and from about 20 to about 70% by weight of (B) based upon the total weight of (A) and (B).

4,123,408
HYDROGEL CONTACT LENS

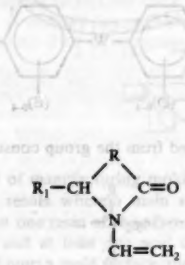
Stanley I. Gordon, Rochester, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 26, 1976, Ser. No. 745,141
Int. Cl.[2] C08L 33/08, 33/10, 25/02; G02C 7/04
U.S. Cl. 260—29.6 TA 15 Claims

1. A shaped transparent contact lens of concave-convex shape with the concave surface substantially conforming to the cornea of the eye, said lens being formed of a hydrogel composition consisting essentially of:

(A) a polymerized water-insoluble but water-swellable polymer composition from:

(1) a water-soluble polymer of a heterocyclic N-vinyl polymerizable compounds containing at least one nitrogen atom in the ring, and a carbonyl functionality adjacent to a nitrogen in the heterocyclic ring and being selected from the group consisting of vinyl lactams having the formula:



wherein R represents an alkylene bridge group of 2 to 4 carbon atoms and R_1 represents a member selected from the group of hydrogen, alkyl, aryl, aralkyl, and alkaryl groups; N-vinyl imidazolidone, N-vinyl succinimide, N-vinyl diglycolylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, and N-vinyl-5-methyl-3-morpholinone; and

(2) a polymerizable mixture consisting essentially of:

(a) polymerizable monoester of an acid selected from the group consisting of acrylic acid, methacrylic acid, and mixtures thereof; and a polyhydric alcohol having 2 to 6 alcohol groups and being selected from the group consisting of ethylene glycol, 1,3-propanediol, a dialkylene glycol, a polyalkylene glycol, 1,6-hexamethylene glycol, 1,4-butanediol, glycerol, trimethylol propane, trimethylolethane, pentaerythritol, mannitol, and sorbitol;

(b) monoethylenically unsaturated esters selected from the group consisting of alkyl acrylates, alkyl methacrylates, vinyl esters of saturated monocarboxylic acids of up to 22 carbon atoms, and mixtures thereof; wherein the alkyl groups of said methacrylate or acrylate contain from 1 to 22 carbon atoms; and

(c) a divinyl compound selected from the group consisting of divinyl benzene, divinyl toluene, and mixtures thereof;

wherein the relative amounts of (A) (1), (A) (2) (a), (A) (2) (b), and (A) (2) (c) are from about 5 to about 40% by weight of (A) (1), from about 93.8% to about 51.8% by weight of (A) (2) (a), from about 1 to about 6% by weight of (A) (2) (b), and from about 0.2 to about 2.2% by weight of (A) (2) (c) based upon the total weight of (A) (1), (A) (2) (a), (A) (2) (b), and (A) (2) (c); and

(B) physiologically acceptable aqueous solution; wherein said hydrogel contains from about 30 to about 80% by weight of (A) based upon the total weight of (A) and (B), and from about 20 to about 70% by weight of (B) based upon the total weight of (A) and (B).

4,123,409
SEALING MATERIAL FOR USE IN CONTACT WITH ANIMAL TISSUE

David H. Kaelble, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 4, 1977, Ser. No. 774,297
Int. Cl.[2] C08L 83/10
U.S. Cl. 260—29.1 SB 2 Claims

1. A method of fabricating a prophylactic device for use in contact with living animal tissue, comprising the steps of:

providing a block copolymer having the general formula

$$(A - B)_n - A \quad n \geq 1.0$$

wherein A is a non-elastomeric thermoplastic polyalphamethylstyrene end block and B is an elastomeric polydimethylsiloxane intermediate block, said blocks forming separate phases A and B, said end blocks A each having a minimum average molecular weight of about 5,000, said elastomeric intermediate block B having a minimum average molecular weight of about 25,000, said block copolymer having an average molecular weight ranging from about 35,000 to about 600,000, the sum of the average molecular weights of both end blocks A being not in excess of 35% of the total average molecular weight of said block copolymer;

admixing a high molecular weight nonvolatile silicone oil in the weight ratio 1 part of said block copolymer to at least 1 part of said oil, said oil being selectively dissolved in said elastomeric intermediate block B phase of said block copolymer; and

forming the mixture into said prophylactic device for use in contacting living animal tissue.

4,123,410
POLYPHENYLENE ETHER RESIN COMPOSITIONS OF REDUCED MELT VISCOSITY

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Sep. 30, 1977, Ser. No. 838,372
Int. Cl.[2] C08K 5/49
U.S. Cl. 260—30.6 R 14 Claims

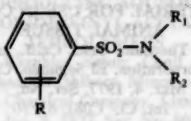
1. A thermoplastic composition comprising by weight, based on the total weight of the composition, a major proportion of polyphenylene ether resin having intimately admixed therewith a minor proportion of a plasticizer; and poly(1,4-butylene terephthalate) or a copolyester thereof with a minor amount of a branching composition in an amount sufficient to reduce the melt viscosity of said composition without substantially reducing the heat distortion temperature and ductility properties thereof.

4,123,411
PLASTICIZED COMPOSITION OF COPOLYETHERESTER ELASTOMER AND AROMATIC SULFONAMIDE

Aubert Y. Coran, Akron, Ohio, assignor to Monsanto Company, St. Louis, Mo.

Filed May 12, 1977, Ser. No. 796,235
Int. Cl.[2] C08G 63/12; C08K 5/04, 5/41, 5/16
U.S. Cl. 260—30.8 R 11 Claims

1. A plasticized composition comprising thermoplastic copolyetherester elastomer consisting essentially of recurring linear etherester and ester segments wherein the etherester segments are derived from difunctional polyether glycol and dicarboxylic acid, and the ester segments are derived from organic diol and aromatic dicarboxylic acid and, in an amount from 10 parts per 100 parts polyester segment up to an amount which exudes from the composition, a normally liquid sulfonamide of the formula



in which R and R_1 are hydrogen or alkyl of 1–6 carbon atoms, R_2 is alkyl of 1–12 carbon atoms and R, R_1 and R_2 contain a total of at least 2 carbon atoms.

4,123,412

URETHANE-BASE SEALING MATERIAL

Kiyou Fukuda, Yokohama; Toshihiko Kawabata, and Kiyotsugu Asai, both of Tokyo, all of Japan, assignors to Mitsui-Nisso Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 630,760, Nov. 11, 1975, abandoned, which is a continuation of Ser. No. 450,469, Mar. 12, 1974, abandoned. This application Jun. 14, 1977, Ser. No. 806,532

Int. Cl.[2] C08K *5/20*

U.S. Cl. 260—30.8 DS **12 Claims**

1. A thixotropic urethane-base sealing material comprising:

(1) a base polymer selected from the group consisting of a urethane prepolymer having isocyanate end groups and a mixture thereof with a polyol having hydroxyl end groups, prior to being hardened;

(2) from 0.5 to 30 parts by weight per 100 parts of base polymer of an anti-sag agent selected from the group consisting of colloidal silica and bentonite; and

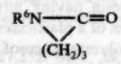
(3) from 0.05 to 10 parts by weight per 100 parts by weight of said base polymer of an anti-sag additive selected from the group consisting of a sulfoxide expressed by the formula

$$R^1SOR^2$$

wherein R^1 and R^2 each represent lower alkyl, and an amide expressed by the formulas

$$R^3CONR^4R^5$$

and



wherein R^3, R^4, R^5 and R^6 are independently hydrogen or lower alkyl.

4,123,413

POLYCARBONATE COMPOSITION CONTAINING URETHANE PLASTICIZER

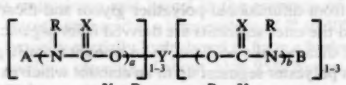
Victor Mark, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1976, Ser. No. 751,450

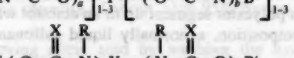
Int. Cl.[2] C08K *5/36, 5/16*

U.S. Cl. 260—32.6 NR **9 Claims**

1. A plasticized polycarbonate composition comprising in admixture a high molecular weight aromatic carbonate polymer and a minor amount of a urethane plasticizer of the following formulae:



I.



II.

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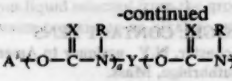
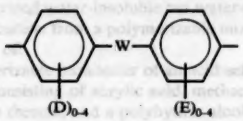
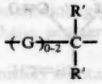


III.

wherein A, A', B, B' and R are independently selected from the group consisting of C_1 to C_{30} alkyl, aryl of 6 to 14 carbon atoms, substituted aryl wherein the substituents are selected from the group consisting of halogen, C_1 to C_{30} alkyl, C_1 to C_{30} alkoxy, aryloxy of 6 to 14 carbon atoms, alkylthio of 1 to 30 carbon atoms, arylthio of 6 to 14 carbon atoms, aralkyl of 7 to 15 carbon atoms, with the proviso that A, B and R may also be hydrogen; X is independently selected from O or S; Y is selected from the group consisting of C_1 to C_{30} alkylene, arylene of 6 to 14 carbon atoms, alkarylene of 7 to 30 carbon atoms, aralkylene of 7 to 30 carbon atoms, $-(CH_2)_{1-4}O-(CH_2)_{1-4}$; $-(CH_2)_{1-4}S-(CH_2)_{1-4}$; Y' is the same as Y and is additionally selected from: C — CH_2 — O — CH_2 — C or

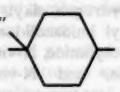


wherein W is selected from the group consisting of:



(a)

wherein G is



and R'' is hydrogen or C_1–C_4 alkyl; R' is independently selected from the group consisting of hydrogen, C_1–C_{15} alkyl, aryl of 6–14 carbon atoms and substituted aryl wherein the substituents are C_1–C_5 alkyl;

$$-CH_2CH_2- \quad \text{(b)}$$

$$-CH_2J-CH_2- \quad \text{(c)}$$

wherein J is C_1–C_{16} alkylene or arylene of 6 to 14 carbon atoms;

(d)

wherein *c* is an integer of 3 to 15;

$$-O-; \quad \text{(3)}$$

$$-S-; \quad \text{(f)}$$

(g)

D and E are independently selected from the group consisting of halogen and C_1–C_{12} alkyl; *a* and *b* are integers of 0–1 with the proviso that the sum of *a* and *b* is at least 1.

4,123,414

METHOD OF MANUFACTURING REINFORCED PHENOL RESIN ARTICLES, AND PRODUCTS THUS OBTAINED

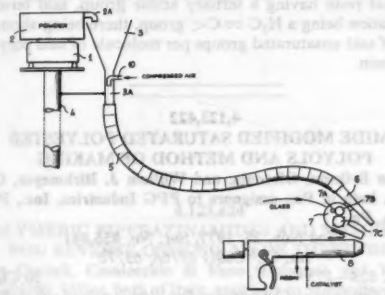
Henri Milette, Chazey-Bons, France, assignor to Societe Chimique des Charbonnages, Courbevoie, France

Filed Nov. 11, 1976, Ser. No. 741,053

Claims priority, application France, Nov. 12, 1975, 75 34448; May 19, 1976, 76 15068

Int. Cl.[2] C08L *61/06;* B28B *1/32*

U.S. Cl. 260—38 4 Claims



1. In a method of manufacturing molded articles of liquid phenol resins or resols wherein main component elements comprising at least one resin of the aforesaid type, glass reinforcing elements and at least one acid catalyst are simultaneously projected onto a mold surface, the improvement comprising simultaneously projecting at least one anhydrous and hydrophilous inorganic compound selected from the group consisting of semi-hydrated calcium sulphate $(SO_4Ca)H_2O$ and finely powdered boric anhydride B_2O_3 with said main component elements in an amount corresponding to from about 8 to 12% of the weight of the liquid phenol resin.

4,123,415

REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED RESISTANCE TO HEAT DEFLECTION

Allen D. Wambach, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 6, 1976, Ser. No. 747,636

Int. Cl.[2] C08K *3/40*

U.S. Cl. 260—40 R 13 Claims

1. A reinforced thermoplastic composition having improved retention of heat deflection temperature, said composition comprising:

(a) a high molecular weight polyester resin; and

(b) a reinforcement therefor comprising glass fibers, said glass fibers having an average standard diameter of no greater than about 0.0005 inches, wherein the glass fibers are present in an amount at least sufficient to provide reinforcement and to improve the resistance to deflection by heat of said composition in comparison with a reinforced composition including glass fibers having an average standard diameter of greater than about 0.0005 inches.

4,123,416

CURABLE COMPOSITION COMPRISING A CALCIUM FLUORO-ALUMINO SILICATE GLASS AND POLY(CARBOXYLIC ACID) OR PRECURSOR THEREOF

William D. Potter, Ware; Andrew C. Barclay, Harlow; Reginald Dunning, Near Wigan, and Richard J. Parry, Southport, all of England, assignors to Smith & Nephew Research Limited, Esses, England

Filed May 11, 1976, Ser. No. 685,486

Claims priority, application United Kingdom, May 13, 1975, 20196/75; May 13, 1975, 20197/75; Aug. 15, 1975, 34128/75

Int. Cl.[2] C08K *7/14*

U.S. Cl. 260—42.18 35 Claims

1. A curable composition comprising a calcium fluoroaluminosilicate glass in particulate form and consisting essentially of from 25 to 35% by weight of silicon calculated as silica, from 30 to 40% by weight of aluminum calculated as alumina, from 20 to 35% by weight calcium, calculated as calcium oxide, and an effective amount up to 9% by weight fluorine; together with a crosslinkable material chosen from the group consisting of poly(carboxylic acids) and polymeric precursors thereof.

13. A curable composition as claimed in claim 1 in the form of a mixture of the particulate glass and solid particulate crosslinkable polymeric material.

26. A curable composition as claimed in claim 13 further comprising a particulate filler.

27. A curable composition as claimed in claim 26 wherein the filler is chosen from silica and alumina.

4,123,417

LOW DENSITY POLYETHYLENE TOUGHENED WITH ETHYLENE/PROPYLENE COPOLYMER

Arne O. Finberg, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 513,680, Oct. 10, 1974, abandoned. This application Aug. 12, 1976, Ser. No. 713,767

Int. Cl.[2] C08L *23/16*

U.S. Cl. 260—42.46 5 Claims

1. Films of blends comprising low density polyethylene having a density of 0.91 to 0.925 containing, by weight of the blend, between about 0.5 percent and about 10 percent of a copolymer consisting of ethylene and propylene having an ethylene content of about 70 weight percent and an X-ray crystallinity of about 11 percent.

4,123,418

STABILIZER SYSTEM FOR STABILIZING STYRENE POLYMERS

Bernard Gilg, Saint-Louis, France; Helmut Muller, Binningen, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 461,188, Apr. 9, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 638,125

Claims priority, application Switzerland, Apr. 19, 1973, 5753/73

Int. Cl.[2] C08K *5/34*

U.S. Cl. 260—45.8 NT 1 Claim

1. A stabilized composition consisting essentially of

(a) An acrylonitrile-butadiene-styrene resin;

(b) A sterically hindered cyclic amine selected from the group consisting of bis-(1,2,2,6,6,-pentamethyl-4-piperidyl)-sebacate and bis-(2,2,6,6-tetramethyl-4-piperidyl)-suberate; and

(c) 2-(2'-hydroxy-5'-methylphenyl)-benztriazole as a co-stabilizer; the ratio of the cyclic amine to the co-stabilizer being from 1:10 to 10:1.

4,123,419

STABILIZED THERMOPLASTIC POLYESTERURETHANES

Herbert L. Heiss, New Martinsville; Robert P. Yeater, Moundsville, and Russell P. Carter, Jr., New Martinsville, all of W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 26, 1977, Ser. No. 828,120
Int. Cl.² C08K 5/35; C08G 18/82
U.S. Cl. 260—45.8 NZ 9 Claims

1. A polyesterurethane stabilized against hydrolysis and/or processing discoloration by having incorporated therein a stabilizing amount of a 2-oxazolidone.

4,123,420

AROMATIC COPOLYESTER COMPOSITION CONTAINING PHOSPHORUS COMPOUNDS

Kayomon Kyo, kyoto; Yasuhiko Asai, Uji, and Shinichi Tokumitsu, Uji, all of Japan, assignors to Unitika Ltd., Amagasaki, Japan

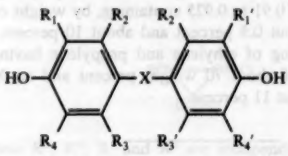
Filed Oct. 28, 1977, Ser. No. 846,670
Int. Cl.² C08G 63/68
U.S. Cl. 528—127 19 Claims

1. A resin composition comprising:

(A) an aromatic copolyester produced by polymerization of a substantially equimolar mixture of the monomeric components

(a) a mixture of (i) terephthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof and (ii) isophthalic acid and/or an acid halide, dialkyl ester or diaryl ester thereof, with the terephthalic acid unit/isophthalic acid unit mole ratio being about 9:1 to about 1:9, and

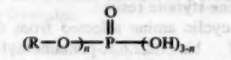
(b) at least one bisphenol of the general formula (I)



(I)

wherein —X— is selected from the group consisting of —O—, —S—, —SO_2—, —SO—, —CO—, an alkylene group containing 1 to 4 carbon atoms or an alkylidene group containing 1 to 4 carbon atoms, and R_1, R_2, R_3, R_4, R_1', R_2', R_3' and R_4', which may be the same or different, each is selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom or an alkyl group containing 1 to 4 carbon atoms, or a metal salt or diester of said bisphenol of the general formula (I), and

(B) about 0.01 to less than about 2% by weight, based on the aromatic copolyester (A), of a phosphorus-containing compound of the general formula (II)



(II)

wherein n is 0 or an integer of 1 to 3, and R is an alkyl group containing 1 to 18 carbon atoms, in which one or more of the hydrogen atoms of the alkyl group may be replaced by a halogen atom or a hydrocarbon group.

4,123,421

STABLE TERTIARY AMINE CONTAINING TERMINALLY UNSATURATED POLYURETHANE RESINS

Richard D. Cowell, Jersey City; Peter Loewrigkeit, Wyckoff, both of N.J.; William Rosenblatt, Pearl River, N.Y., and Claire Bluestein, Secaucus, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,437
Int. Cl.² C08G 18/10
U.S. Cl. 528—65 24 Claims

1. A substantially linear terminally unsaturated polyurethane resin said resin having a tertiary amine group, said terminal unsaturation being a $H_2C=C<$ group, there being about 1.5 to 2.5 of said unsaturated groups per molecule of said polyurethane resin.

4,123,422

AMIDE MODIFIED SATURATED POLYESTER POLYOLS AND METHOD OF MAKING

J. Alden Erikson, Gibsonia, and William J. Birkmeyer, Oakmont, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 25, 1977, Ser. No. 855,041
Int. Cl.² C08G 63/68, 63/76
U.S. Cl. 528—273 20 Claims

1. An amide modified saturated polyester polyol wherein the polester polyol backbone is prepared from a polyhydric alcohol having from 2 to 15 carbon atoms and a polybasic carboxylic acid having from 4 to 14 carbon atoms, said polyester polyol backbone having an acid number of from about 3 to about 30 and a hydroxyl number of from about 10 to about 300, said polyester polyol backbone being modified with a primary or secondary amine of formula $N(H)(R)_a(C_yH_{2y}OH)_b$ where R is hydrogen or an alkyl group containing from 1 to 4 carbon atoms, y is 2 or 3, a is 0 or 1 and b is 1 or 2 with the proviso that $a + b = 2$, said amide modified polyester polyol having an acid number of from about 0 to about 27, a hyrdoxyl number of from about 12 to about 360 and an amine number of from about 0.1 to about 6.5.

4,123,423

PROCESS FOR THE MANUFACTURE OF PLASTICS CONTAINING ESTER AND/OR URETHANE GROUPS

Wolfgang Wenzel, and Dieter Dieterich, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 13, 1977, Ser. No. 832,778
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642073
Int. Cl.² C08G 18/00
U.S. Cl. 528—71 12 Claims

1. A process for the preparation of self cross-linking films from aqueous dispersions comprising

1. preparing a polyester or polyurethane oligomer which

a. has a number average molecular weight below about 20,000,

b. has a softening point of at least about 40° C.,

c. contains hydrophilic groups selected from the group consisting of:

i. about 4 to 180 milliequivalents per 100 g of oligomer of ionic groups and groups capable of conversion to ionic groups,

ii. about 2 to 20 weight percent, based on the weight of oligomer of ethylene oxide units of the formula

—CH_2—CH_2—O— and

iii. mixtures of i) and ii), and

d. contains cross-linking sites selected from the group consisting of:

i. olefinic double bonds reactive with atmospheric oxygen,

ii. sulphhydryl groups and
iii. blocked isocyanate groups which liberate free isocyanate groups at elevated temperatures,

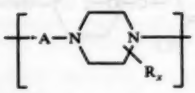
2. combining said oligomer in the form of lumps or coarse powders with water to form a storage stable dispersion with the conversion of those potential ionic groups to ionic groups in a known manner which are necessary to assure a stable dispersion before, during or after the combination with water,
3. applying the dispersion to a substrate to form a film and
4. drying and cross-linking the film so formed through the action of heat and/or siccatives.

4,123,424
POLYMERIC PIPERAZINAMIDES AND MEMBRANES FOR REVERSE OSMOSIS MADE THEREFROM

Lino Credali, Casalecchio di Reno (Bologna), and Vincenzo Guidotti, Milan, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 466,677, May 3, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,760
Claims priority, application Italy, May 7, 1973, 23770 A/73
Int. Cl.[2] C08G *69/26;* B01D *39/16*
U.S. Cl. 528—337 3 Claims

1. A membrane forming polymeric piperazinamide consisting essentially of the repeating unit having a structure defined by the formula (I):

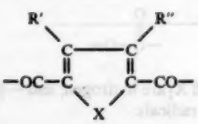


(I)

wherein the group defined by the general formula (II):

(II)

is a bivalent piperazine radical, wherein x is zero or a whole number from 1 to 8, and where, when x is not zero, R is alkyl; said —A— groups representing at least two different dicarbonylic groups, a first dicarboxylic group having a structure defined by the formula (III):



(III)

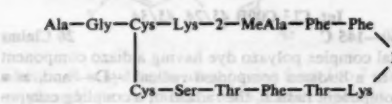
wherein X is oxygen or sulfur, and R′ and R″ are independently selected from the group consisting of hydrogen, alkyl, and aryl radicals; and constituting at least 10 mol% of said —A— groups and a second dicarboxylic group constituting that portion of said A groups that is not made up of dicarbonylic radicals of the formula (III), and being the dicarbonylic radical from one or more dicarboxylic acids selected from the group consisting of fumaric, mesaconic, orthophthalic, isophthalic, terephthalic and thiofurazan-3,4-dicarboxylic acid.

4,123,425
(2-MEALA[5])-SOMATOSTATIN AND ANALOGUES THEREOF

Victor M. Garsky, Radnor, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,686
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 S 3 Claims

1. A polypeptide of the formula:



its linear reduced form or a non-toxic acid addition salt thereof in which X_8 is L—Trp or D—Trp.

4,123,426
PROCESS FOR DECOMPOSING MICROBIAL CELLS

Masao Katayama, Niigata, and Yataro Tabeta, Tokyo, both of Japan, assignors to Mitsubishi Gas Chemical Company, Inc. and Daiichi Kasei Sangyo Co., Ltd., both of Japan

Filed Aug. 2, 1977, Ser. No. 821,316
Claims priority, application Japan, Aug. 5, 1976, 51-93833
Int. Cl.[2] A23J *1/18;* C07G *7/00*
U.S. Cl. 260—112 R 4 Claims

1. A process for decomposing microbial cells to obtain foamable hydrolyzed proteins, which comprises treating the microbial cells with an alkaline aqueous solution containing an alkaline earth metal hydroxide and an alkali metal hydroxide, said alkaline earth metal hydroxide being at least one compound selected from the group consisting of calcium hydroxide, barium hydroxide and magnesium hydroxide, and said alkali metal hydroxide being at least one compound selected from the group consisting of sodium hydroxide and potassium hydroxide, the alkaline earth metal hydroxide being 15 to 50% by weight and the amount of the alkali metal hydroxide being 2 to 20% by weight, both based on the weight of the microbial cells.

4,123,427
METHOD FOR THE PURIFICATION OF MYCOBACTERIAL PROTEIN ANTIGENS AND RESULTING PRODUCT

Thomas M. Daniel, 3028 Chadbourne Rd., Shaker Heights, Ohio 44120

Filed Jul. 27, 1976, Ser. No. 708,950
Int. Cl.[2] A23J *1/06*
U.S. Cl. 260—112 B 26 Claims

1. A process for the preparation of an antigen for the recognition and measurement of hypersensitivity where antigenic specificity is desired by immunoabsorbent affinity chromatography, comprising:

coupling antibodies to an appropriate inert substrate by chemical bonding to form an absorbent in which said specific antibody acts as a ligand;
preparing crude mixtures containing desired said antigen;
absorbing said antigen from said crude mixtures containing said antigen by the said prepared absorbent;
eluting the desired said antigen from said absorbent using 3–6 molar urea at PN 7 - 9
recovering the purified antigen.

4,123,428

METALLIZED POLYAZO DYES DERIVED FROM A COUPLING COMPONENT OBTAINED BY ACIDIC CONDENSATION OF FORMALDEHYDE WITH AT LEAST ONE PHENOLIC COMPOUND

Herbert Holliger, Allschwil, and Heinz Wicki, Basel, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Aug. 25, 1976, Ser. No. 717,523

Claims priority, application Switzerland, Sep. 2, 1975, 11404/75

Int. Cl.[2] C09B 45/24, 45/34

U.S. Cl. 260—145 C 26 Claims

1. A metal complex polyazo dye having a diazo component radical D- or a bisdiazo component radical —D— and, as a coupling component radical, the radical of a coupling component K,

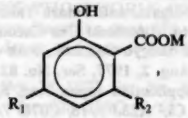
wherein

D— is a diazo component radical having at least one metallized azo group,

—D— is a bisdiazo component radical having at least one metallized azo group, and

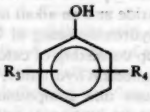
K is the product of the condensation, under acidic conditions, of formaldehyde with

(i) a compound of the formula



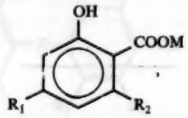
or a mixture of such compounds,

(ii) a compound of the formula

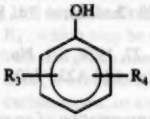


or a mixture of such compounds, or

(iii) a compound of the formula



or a mixture of such compounds, and a compound of the formula



or a mixture of such compounds,

wherein each of

R_1, R_2, R_3 and R_4 is independently hydrogen, halo, hydroxy, alkyl, substituted alkyl, alkoxy or substituted alkoxy, and

M is hydrogen or a non-chromophoric cation, with the provisos that the mol ratio of formaldehyde to the compound or mixture of compounds of (i), (ii) or (iii) is at least 0.6:1 and that at least 50 mol % of the compounds or mixture of compounds of (i), (ii) or (iii) contains a —COOM group,

wherein

M is hydrogen or a non-chromophoric cation.

4,123,429

1:1 CHROMIFEROUS COMPLEX AZO COMPOUNDS HAVING A BIDENTATE CHELATING GROUP AND A MONOFUNCTIONAL NEUTRAL LIGAND

Claude M. H. E. Brouard, Sotteville les Rouen, and Paulette G. Ficht, Mont Saint Aignan, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

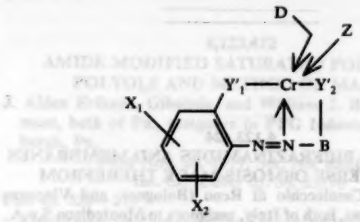
Continuation of Ser. No. 609,638, Sep. 2, 1975, abandoned, which is a continuation of Ser. No. 426,379, Dec. 19, 1973, abandoned. This application Oct. 27, 1976, Ser. No. 736,027

Claims priority, application France, Dec. 28, 1972, 72.46599

Int. Cl.[2] C09B 45/16

U.S. Cl. 260—147 6 Claims

1. A chromiferous complex of formula:



in which

D is the residue of a bidentate chelating agent selected from the group consisting of acetylacetone, benzoylacetone, 1,3-diphenyl-1,3-propanedione and salicylaldehyde:

Y'_1 is oxygen or

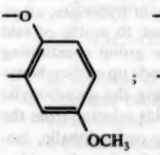
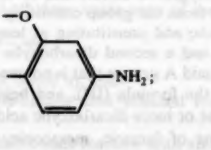
Y'_2 is oxygen or

Z is a monofunctional neutral ligand selected from the group consisting of ammonia, pyridine, ethylamine, ethanolamine and laurylamine;

X_1 is hydrogen, chlorine or nitro;

X_2 is hydrogen, chloro, nitro, sulfonamido or methylsulfonamido, with the proviso that X_1 is always hydrogen when X_2 is sulfonamido or methylsulfonamido and that Y'_1 is

when both X_1 and X_2 are hydrogen; and —B—Y'_2— is one of the following radicals:

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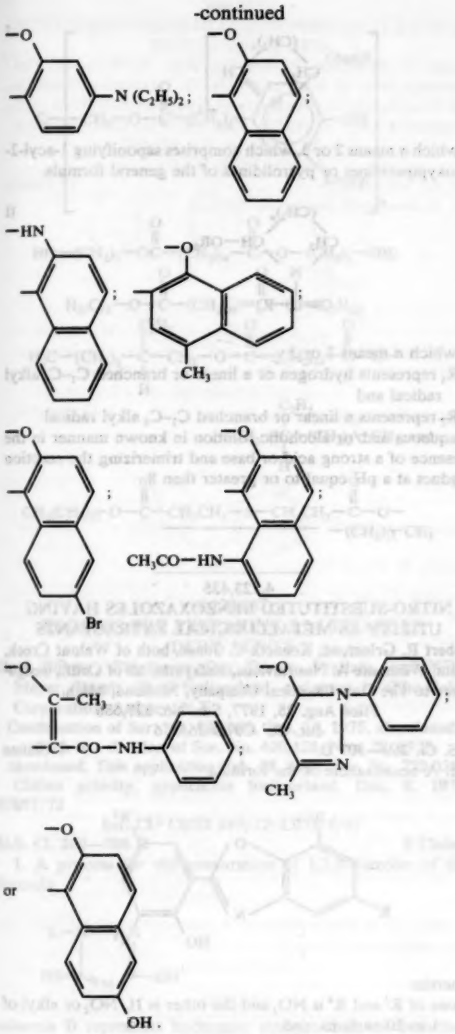


or

wherein R is hydrogen, alkyl having from 1 to 7 carbon atoms or phenyl; Ar is phenyl, trifluoromethylphenyl or phenyl substituted with 1 or 2 halogen, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms; X and Y are each hydrogen, halogen, alkyl having from 1 to 7 carbon atoms or alkoxy having from 1 to 7 carbon atoms; and the dotted line represents a single bond wherein hydrogen is attached to N or a double bond.

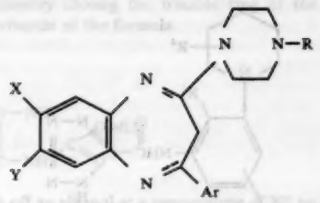
4,123,430

2-ARYL-4-(1-PIPERAZINYL)-3H-1,5-BENZODIAZEPINES

Charles R. Ellefson, Chicago, and Fred M. Hershenson, Morton Grove, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 10, 1977, Ser. No. 850,438
Int. Cl.[2] C07D *295/12, 403/04*
U.S. Cl. 260—243.3 **15 Claims**

1. A compound of the formula



wherein R is hydrogen, alkyl having from 1 to 7 carbon atoms or phenyl; Ar is phenyl, trifluoromethylphenyl or phenyl substituted with 1 or 2 halogen, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms; X and Y are each hydrogen, halogen, alkyl having from 1 to 7 carbon atoms or alkoxy having from 1 to 7 carbon atoms; and the dotted line represents a single bond wherein hydrogen is attached to N or a double bond.

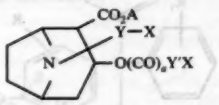
4,123,431

NON-OXO-CARBONYL CONTAINING BENZOYL ECGONINE AND COCAINE COMPOUNDS AND DERIVATIVES THEREOF

Michael J. Soffer, Los Angeles, and Richard S. Schneider, Saratoga, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Division of Ser. No. 364,842, May 29, 1973, Pat. No. 4,045,420.
This application May 6, 1977, Ser. No. 794,442
Int. Cl.[2] C07D *451/12, 451/06*
U.S. Cl. 260—292 **16 Claims**

1. A compound of the formula:



wherein

A is hydrogen or methyl;

one of Y and Y' is hydrocarbylene of from 1 to 10 carbon atoms, wherein Y–X is methyl when Y' is hydrocarbylene and Y'X is phenyl or hydrogen when Y is hydrocarbylene;

X, when bonded to hydrocarbylene, is a non-oxo-carbonyl functionality selected from the group consisting of carboxylic acid, mixed anhydride, and imidate; and

a is zero when Y'X is hydrogen and one when Y'X is other than hydrogen.

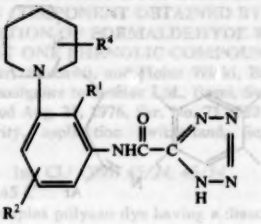
4,123,432

TETRAZOLE-5-CARBOXAMIDE DERIVATIVES

John H. Sellstedt, Pottstown, and Dieter H. Klaubert, Perkiomenville, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 726,374, Sep. 24, 1976, which is a division of Ser. No. 669,570, Mar. 23, 1976, Pat. No. 4,013,647.
This application Dec. 23, 1977, Ser. No. 864,064
Int. Cl.[2] C07D *401/12*
U.S. Cl. 260—293.69 **5 Claims**

1. A compound of the formula:



in which

R^1 is —CN or —$CONH_2$;

R^2 is hydrogen, lower alkyl, lower alkoxy, halo, polyhalo(lower)alkyl, lower alkyl carbonyl or carb (lower) alkoxy; and

R^4 is hydrogen or lower alkyl; or a pharmaceutically acceptable salt thereof.

4,123,433

2-CYANO-5-(SUBSTITUTED TRIPHENYLMETHYL) PYRIDINES

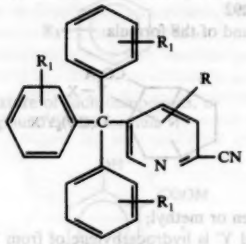
Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 636,010, Nov. 28, 1975, Pat. No. 4,044,140. This application Aug. 12, 1977, Ser. No. 824,026

Int. Cl.[2] C07D *213/57*

U.S. Cl. 260—294.9 **3 Claims**

1. A compound of the formula



and the pharmaceutically acceptable salts thereof wherein R is hydrogen or alkyl; each R_1 is a member selected from the group consisting of hydrogen, hydroxy, alkyl, alkoxy, trifluoromethyl and phenyl wherein said alkyl or alkoxy contains up to 12 carbon atoms.

4,123,434

PROCESS FOR PREPARING TRIMERIC Δ^1-PIPERIDEINS AND TRIMERIC 1-PYRROLINE

Klaus Warning, Liederbach, and Michael Mitzlaff, Bad Homburg, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

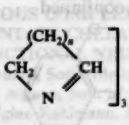
Filed Aug. 9, 1977, Ser. No. 823,155

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1976, 2636098

Int. Cl.[2] C07D *213/22, 207/20*

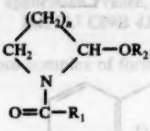
U.S. Cl. 260—296 D **6 Claims**

1. Process for the manufacture of aliphatic cyclic nitrogen bases of the general formula



I

in which *n* means 2 or 3, which comprises saponifying 1-acyl-2-alkoxypiperidines or pyrrolidines of the general formula



II

in which *n* means 2 or 3

R_1 represents hydrogen or a linear or branched C_1–C_4 alkyl radical and

R_2 represents a linear or branched C_1–C_4 alkyl radical

in aqueous and/or alcoholic solution in known manner in the presence of a strong acid or base and trimerizing the reaction product at a pH equal to or greater than 8.

4,123,435

NITRO-SUBSTITUTED BENZOXAZOLES HAVING UTILITY AS METALLURGICAL EXTRACTANTS

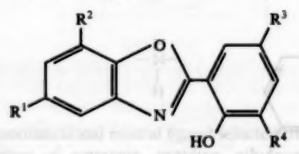
Robert R. Grinstead; Kenneth C. Jones, both of Walnut Creek, and Wilmonte A. Nasutavicus, Lafayette, all of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1977, Ser. No. 827,650

Int. Cl.[2] C07D *263/56*

U.S. Cl. 260—307 D **7 Claims**

1. A benzoxazole of the formula



wherein:

one of R^3 and R^4 is NO_2 and the other is H, NO_2 or alkyl of 1 to 20 carbons, and

R^1 and R^2 independently are H or alkyl of 1–20 carbons,

with the proviso that R^1, R^2, R^3 and R^4 contain a total of at least 7 carbons.

4,123,436

POLYCARBONATE COMPOSITION PLASTICIZED WITH ESTERS

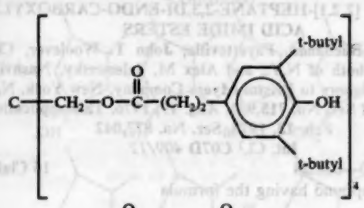
Fred F. Holub, Schenectady, N.Y.; Steven W. Scott, Evansville, and Phillip S. Wilson, Mt. Vernon, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 16, 1976, Ser. No. 751,433

Int. Cl.[2] C08K *5/36, 5/09, 5/10*

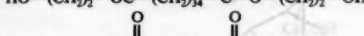
U.S. Cl. 260—30.8 R **3 Claims**

1. A plasticized polycarbonate composition comprising a mechanical admixture of a high molecular weight aromatic carbonate polymer and about 0.05–5.0 parts per hundred parts of said aromatic carbonate polymer of an ester selected from the following group of esters:

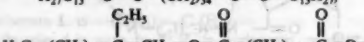


;

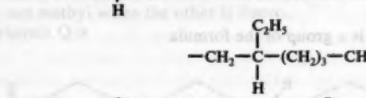
b)

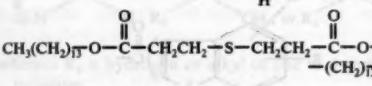


c)



d)





e)

4,123,437

PROCESS FOR PREPARING 1,2,4-TRIAZOLE DERIVATIVES

Beat Böhner, Binningen; Dag Dawes, Pratteln, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

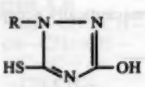
Continuation of Ser. No. 587,500, Jun. 16, 1975, abandoned, which is a division of Ser. No. 420,121, Nov. 29, 1973, abandoned. This application Feb. 28, 1977, Ser. No. 773,026

Claims priority, application Switzerland, Dec. 8, 1972, 17897/72

Int. Cl.[2] C07D *249/12*; C07F *9/65*

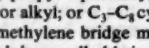
U.S. Cl. 260—308 R 5 Claims

1. A process for the preparation of 1,2,4-triazoles of the formula

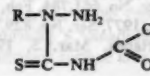


wherein B represents hydrogen; straight-chain or branched C_1–C_{18} alkyl optionally substituted by halogen, cyano, nitro, thiocyano, alkoxycarbonyl, N-alkyl-carbamoyl, N,N-dialkyl carbamoyl, alkoxy or alkylthio; straight-chain or branched C_3–C_8 alkenyl or C_3–C_8 alkynyl, each optionally substituted by methyl or ethyl; phenyl optionally substituted by halogen, haloalkyl, nitro, alkyl, cyano, thiocyano, alkoxy, alkylthio, alkylsulphonyl, alkylsulphinyl, phenoxy, phenylthio, phenylsulphonyl, phenylsulphinyl, benzyloxy, benzylthio, benzylsulphonyl or benzylsulphinyl; naphthyl, benzyl, phenylethyl or phenylpropyl optionally, substituted by halogen, haloalkyl, nitro or alkyl; or C_3–C_8 cycloalkyl which can be bound by way of a methylene bridge member, or be substituted by an alkyl radical, lower alkyl being indicated for the alkyl groups in all of said substituted groups having an alkyl substituent; which process comprises adding, at a temperature of −40° to +100° C., a hydrazine of the formula

to an alkoxycarbonyl-isothiocyanate of the formula

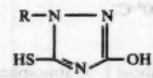


a) and subsequently closing the triazole ring of the resulting thiosemicarbazide of the formula

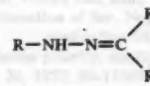


b) by splitting off an alkanol at a temperature of 20° to 120° C. in the presence of an inorganic or an organic acid or an acid salt.

5. A process for the preparation of 1,2,4-triazoles of the formula



wherein R represents hydrogen; straight-chain or branched C_1–C_{18} alkyl optionally substituted by halogen, cyano, nitro, thiocyano, alkoxycarbonyl, N-alkyl-carbamoyl, N,N-dialkyl carbamoyl, alkoxy or alkylthio; straight-chain or branched C_3–C_8 alkenyl or C_3–C_8 alkynyl, each optionally substituted by methyl or ethyl; phenyl optionally substituted by halogen, nitro, alkyl, cyano, thiocyano, alkoxy, alkylthio, alkylsulphonyl, alkylsulphinyl, phenoxy, phenylthio, phenylsulphonyl, phenylsulphinyl, benzyloxy, benzylthio, benzylsulphonyl or benzylsulphinyl; naphthyl benzyl, phenylethyl or phenylpropyl optionally substituted by halogen, haloalkyl, nitro or alkyl; or C_3–C_8 cycloalkyl which can be bound by way of a methylene bridge member, or be substituted by an alkyl radical, lower alkyl being indicated for the alkyl groups in all of said substituted groups having an alkyl substituent; in which process a hydrazone of the formula



wherein

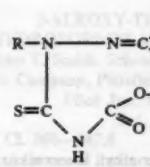
R has the above given meanings,

R_1 represents hydrogen or lower alkyl, and

R_2 represents lower alkyl,

is reacted in the presence of an inert solvent with an alkoxycarbonyl-isothiocyanate of the formula

to form a thiosemicarbazone of the formula



and this intermediate is subsequently heated in an aqueous medium in the presence of hydrochloric acid to effect ring closure.

4,123,438
PROCESS FOR PREPARING 2-PYRROLIDONES

Leonardus H. Geurts, Sittard, and Peter J. N. Meijer, Munstergeleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 784,367, Apr. 4, 1977, abandoned, which is a continuation of Ser. No. 661,784, Feb. 26, 1976, abandoned. This application Sep. 1, 1977, Ser. No. 829,781
Claims priority, application Netherlands, Mar. 5, 1975, 7502574
Int. Cl.[2] C07D *207/26*
U.S. Cl. 260—326.5 FN 11 Claims

1. In a process for the preparation of 2-pyrrolidone comprising the steps of hydrogenating 1,2-dicyanoethane and then hydrolyzing the reaction product by treatment with water at an elevated temperature and recovering the 2-pyrrolidone product, the improvement comprising conducting the hydrogenation step:

(1) at a temperature of about 50°–200° C.,

(2) in the liquid phase,

(3) in the presence of ammonia, and

(4) at a partial hydrogen pressure of about 1–50 atmospheres, and thereafter conducting the hydrolysis step at a temperature of about 100°–300° C.

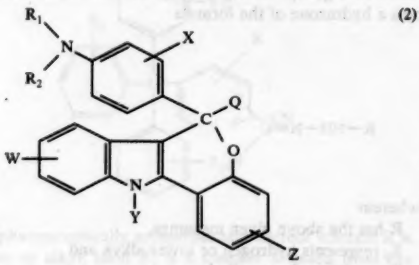
4,123,439
CHROMENOINDOLE COMPOUNDS

Heinz Balli, Riehen; Sigmund Gunzenhauser, Arlesheim, and Jean C. Petitpierre, Kaiseraugst, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 20, 1977, Ser. No. 799,063
Claims priority, application Switzerland, Jun. 4, 1976, 7115/76
Int. Cl.[2] C07D *491/04*
U.S. Cl. 260—326.5 B 3 Claims

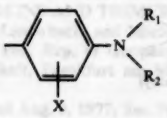
1. A chromenoindole compound of the formula

(2)



wherein R_1 and R_2 independently of one another represent lower alkyl, phenyl or benzyl, and R_1 also represents hydrogen, or R_1 and R_2, together with the nitrogen atom which links them, represent pyrrolidino, piperidino or morpholino, X represents hydrogen, halogen, methyl or lower alkoxy, Q represents hydrogen, lower alkyl, phenyl, benzyl or the group of the formula

(2a)



W represents hydrogen, halogen, lower alkyl, lower alkoxy or phenoxy, Y represents hydrogen, lower alkyl, phenyl or benzyl and Z represents hydrogen, halogen, lower alkyl, lower alkoxy, amino or amino substituted by lower alkyl, benzyl or phenyl.

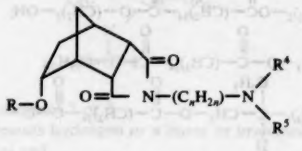
4,123,440
BICYCLO [2.2.1]-HEPTANE-2,3,DI-ENDO-CARBOXYLIC ACID IMIDE ESTERS

Ronald L. Buchanan, Fayetteville; John T. Woolever, Chittenango, both of N.Y., and Alex M. Jelenevsky, Nashville, N.C., assignors to Bristol-Myers Company, New York, N.Y.

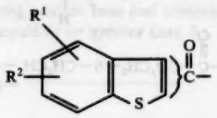
Division of Ser. No. 715,951, Aug. 19, 1976. This application Feb. 13, 1978, Ser. No. 877,042
Int. Cl.[2] C07D *409/12*
U.S. Cl. 260—326.28 16 Claims

1. A compound having the formula

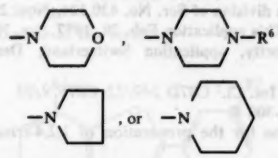
I



wherein R is a group of the formula



in which R^1 and R^2 are alike or different and are each hydrogen, chloro, bromo, fluoro, (lower)alkyl, nitro, trifluoromethyl, hydroxy or (lower)alkoxy, n is an integer of 2 to 4 inclusive and R^4 and R^5 are alike or different and each is hydrogen, (lower)alkyl or, when taken together with the nitrogen, a heterocyclic ring of the formula



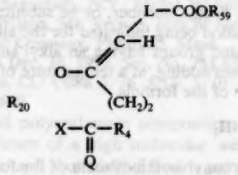
in which R^6 is (lower)alkyl; or a pharmaceutically acceptable acid addition salt thereof.

4,123,441
ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

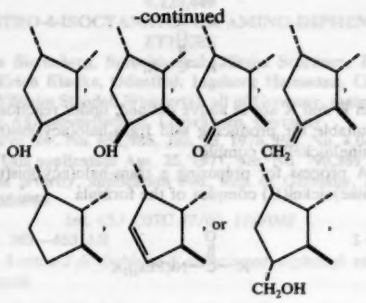
Continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,856
Int. Cl.[2] C07D *311/02*; A61K *31/35*
U.S. Cl. 260—345.2 22 Claims

1. A 4Z compound of formula

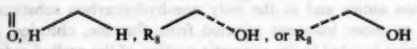


wherein R_{20} is

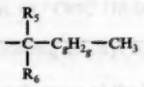
-continued



wherein L is $-(CH_2)_d-C(R_2)_2-$
wherein *d* is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro,
wherein Q is



wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_{59} is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive,
or (c) a pharmacologically acceptable cation; wherein R_4 is



wherein C_5H_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between $-CR_5R_6-$ and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro; and
wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

4,123,442

REGENERATION OF MALEIC ANHYDRIDE VANADIUM-PHOSPHORUS-OXYGEN CATALYST BY CONTACTING WITH SULFUR TRIOXIDE

Kiran R. Bakshi, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

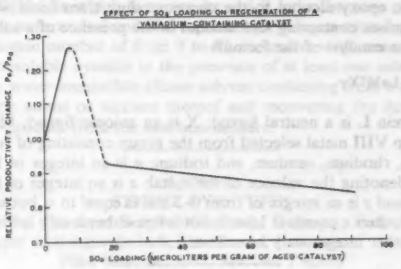
Filed Jun. 24, 1977, Ser. No. 809,735
Int. Cl.² C07D *307/60*; B01J *27/28, 23/92*
U.S. Cl. 260—346.75 **13 Claims**

1. A process for partially regenerating the catalytic properties of an aged vanadium-phosphorus-oxygen catalyst used in the oxidation of hydrocarbons to maleic anhydride, which comprises contacting the aged catalyst with sulfur trioxide under conditions effective to increase the average vanadium valence of the aged catalyst to a value from about 3.9 to about 4.6.

3. A process according to claim 1 wherein regeneration is carried out during the course of said oxidation of hydrocarbons.

5. A process according to claim 1 wherein the aged catalyst is contacted with an amount of sulfur trioxide in microliters per gram of aged catalyst up to an amount equal to about 135 times the difference between the initial average vanadium valence of the catalyst and the average vanadium valence of the aged catalyst.

9. In a process for production of maleic anhydride from the oxidation of hydrocarbons which comprises contacting said hydrocarbon in the vapor phase with a solid complex catalyst comprising a vanadium-phosphorus-oxygen complex having an intrinsic surface area in the range from about 7 to 50 square



meters per gram, a phosphorus to vanadium atomic ratio in the range 0.9–1.8:1, and an average vanadium valence in the range 3.9 to 4.6, wherein the catalytic properties of the catalyst for the production of maleic anhydride from said hydrocarbon have decreased from a level achieved during earlier catalyst life; the improvement which comprises contacting said aged catalyst complex with sulfur trioxide under conditions effective to increase the average vanadium valence of the aged catalyst to a value from about 3.9 to about 4.6.

4,123,443

PROCESS FOR THE PREPARATION OF BROMOACETIC ACID AND ESTERS THEREOF

Umekawa Osamu, Takatsuki; Takemori Koji, Osaka, and Katayama Sakae, Kobe, all of Japan, assignors to Katayama Chemical Works Co., Ltd., Osaka, Japan

Continuation of Ser. No. 721,792, Sep. 9, 1976, abandoned. This application Mar. 6, 1978, Ser. No. 883,519
Claims priority, application Japan, Sep. 16, 1975, 50-112381; Sep. 20, 1975, 50-113897
Int. Cl.² C07C *53/16, 69/63*
U.S. Cl. 260—347.4 **10 Claims**

1. A process for the preparation of bromoacetic acid esters which comprises gradually adding concentrated sulfuric acid to an aqueous solution of chloroacetic acid and an alkali metal bromide or ammonium bromide, maintaining the resulting mixture at a temperature of from about 40° C to about 70° C, adding to the reaction an organic solvent which is capable of forming an azeotrope, heating while removing water, and adding an alcohol and further heating, followed by isolating a bromoacetic acid ester from the resulting organic layer.

4,123,444

2-ALKOXY-TETRAHYDROFURANS VIA HYDROFORMYLATION OF ALLYLIC ALCOHOLS

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jun. 13, 1977, Ser. No. 806,073
Int. Cl.² C07D *307/20*
U.S. Cl. 260—347.8 **11 Claims**

1. A process for preparing a 2-alkoxytetrahydrofuran or 2-alkoxy-substituted tetrahydrofuran which comprises contacting an allylic alcohol, carbon monoxide, hydrogen and a corresponding alkanol with a rhodium hydroformylation catalyst.

4,123,445
NOVEL HOMOGENEOUS TRANSITION-METAL CATALYZED GEOMETRIC ISOMERIZATION OF CYCLIC EPOXY ALCOHOLS

James E. Lyons, Wallingford, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Nov. 13, 1974, Ser. No. 523,310
Int. Cl.[2] C07D *301/00*
U.S. Cl. 260—348.12 6 Claims

1. A process for the geometrical isomerization of a cis-hexacyclic epoxy alcohol to the corresponding trans-form which comprises contacting said alcohol in the presence of a solvent with a catalyst of the formula

$$LxM^{n}Xy$$

wherein L is a neutral ligand; X is an anionic ligand; M is a group VIII metal selected from the group consisting of ruthenium, rhodium, osmium, and iridium; *n* is an integer of from 0–3 denoting the valence of the metal; *x* is an integer of from 0–6; and *y* is an integer of from 0–3 and is equal to *n*, but when *n* is 0, then *x* equals at least 1; but when either *x* or *y* is 0, then the other integer may be at least 1.

4,123,446
SYNTHESIS OF METAL ALKYL CARBONATES

Stylianos Sifniades, Madison; Allen A. Tunick, Boonton, and Herbert C. Wohlers, Mountain Lakes, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 11, 1977, Ser. No. 786,160
Int. Cl.[2] C07F *15/04*
U.S. Cl. 260—439 R 11 Claims

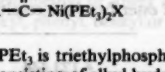
1. A process for preparing metal alkyl carbonates which comprises reacting an inorganic metal salt with an alkyl monohydric alcohol containing 1 to 3 carbon atoms and carbon dioxide under substantially anhydrous conditions in the presence of a solid acid acceptor, said salt being soluble in said alcohol and said alcohol being employed in sufficient amount to form a solution of the resulting metal alkyl carbonate in the alcohol.

4,123,447
TRANS-HALO(ACYL)BIS(TRIETHYLPHOSPHINE)-NICKEL(II) COMPLEXES AND PREPARATION THEREOF

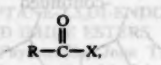
Darryl R. Fahey, and John E. Mahan, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 8, 1976, Ser. No. 739,763
Int. Cl.[2] C07F *15/04*
U.S. Cl. 260—439 R 37 Claims

15. A process for preparing a trans-halo(acyl)bis(triethylphosphine)nickel(II) complex of the formula

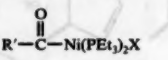


wherein X is halogen; PEt_3 is triethylphosphine; and R is selected from the group consisting of alkyl hydrocarbon radicals containing 1 to 12 carbon atoms; aryl hydrocarbon radicals containing 6 to 12 carbon atoms; substituted aryl radicals containing 6 to 12 carbon atoms and having as the only non-hydrocarbon substituents 1 or 2 halogens selected from fluorine, chlorine, and bromine bonded to the aromatic portion of the aryl radical; and substituted aralkyl radicals containing 7 to 12 carbon atoms and having as the only non-hydrocarbon substituents one or more halogens selected from fluorine, chlorine, and bromine bonded to the aromatic portion of the aralkyl radical, comprising reacting in solution (1,5-cyclooctadiene)-bis(triethylphosphine)nickel(O) and an acyl halide of the formula



wherein R and X are as above defined, under reaction conditions suitable for producing said trans-halo(acyl)bis(triethylphosphine)nickel(II) complex.

21. A process for preparing a trans-halo(acyl)bis(triethylphosphine)nickel(II) complex of the formula



wherein X is a halogen; PEt_3 is triethylphosphine; and R′ is selected from the group consisting of aryl hydrocarbon radicals containing 6 to 12 carbon atoms; substituted aryl radicals containing 6 to 12 carbon atoms and as the only non-hydrocarbon substituents 1 or 2 halogens selected from fluorine, chlorine, and bromine bonded to the aromatic portion of the aryl radical; and substituted aralkyl radicals containing 7 to 12 carbon atoms and as the only non-hydrocarbon substituents one or more halogens selected from fluorine, chlorine, and bromine bonded to the aromatic portion of the aralkyl radical, said process comprising reacting a solution of nickel complex of the formula $R'—Ni(PEt_3)_2X$, wherein R′, PEt_3, and X are as defined above, with carbon monoxide under conditions sufficient to produce said trans-halo(acyl)bis(triethylphosphine)-nickel(II) complex.

4,123,448
ADIABATIC REACTOR

Joseph A. Kleinpeter, McMurray, Pa., assignor to Continental Oil Company, Stamford, Conn.

Filed Jun. 1, 1977, Ser. No. 802,383
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—449 M 8 Claims

1. A method for improving the efficiency of an adiabatic, catalytic reactor for exothermic reactions, wherein said reactor includes a catalyst bed, positioned in said reactor, said method comprising;

(a) passing a first fluid reactant stream comprising carbon oxides, hydrogen, and water into a first end of said catalyst bed at reaction conditions so that said carbon oxides and hydrogen react to form methane as the stream passes along the length of said catalyst bed toward a second end of said catalyst bed;

(b) determining a first location in said catalyst bed at which the catalyst temperature has increased to a substantially constant value;

(c) injecting a second fluid reactant stream comprising carbon oxides, hydrogen and water into said catalyst bed between said first location and said second end of said catalyst bed;

(d) determining a second location in said catalyst bed at which the catalyst temperature has increased to a substantially constant value, said second location being between the point at which said second fluid reactant stream is introduced and said second end of said catalyst bed;

(e) injecting a third fluid reactant stream comprising carbon oxides, hydrogen and water between said second location and said second end of said catalyst bed; and,

(f) recovering methane from said reactor.

4,123,449
4-NITRO-4-ISOCYANATO- OR AMINO-DIPHENYL ETHERS

Wilhelm Sirrenberg, Sprockhoevel; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

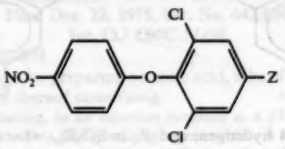
Division of Ser. No. 651,986, Jan. 23, 1976, Pat. No. 4,041,177. This application Apr. 25, 1977, Ser. No. 790,359

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1975, 2504983

Int. Cl.[2] C07C *87/60, 119/048*

U.S. Cl. 260—453 AR 3 Claims

1. A 4-nitro-2',6'-dichloro-4'-substituted diphenyl ether of the formula



wherein

Z: is NH_2 or NCO.

4,123,450
PROCESS FOR PREPARING ALKYL ISOCYANATES

Harry W. Weber, Jr., Newtown, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Sep. 22, 1977, Ser. No. 835,564

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P 7 Claims

1. A process for producing an alkyl isocyanate which comprises:

(1) reacting a hydroxybenzene of the formula

wherein R is hydrogen or lower alkyl of 1 or 2 carbon atoms, and phosgene in a halogenated hydrocarbon solvent with an aqueous alkali metal hydroxide, permitting the aqueous and organic phases to separate, removing the aqueous phase and recovering the organic phase comprising a solution of the corresponding chloroformate in said solvent,

(2) reacting the organic phase recovered from step 1, in the presence of an alkali metal hydroxide, with an alkylamine in which the alkyl group corresponds to the alkyl group of the alkyl isocyanate, allowing the aqueous and organic phases to separate, and recovering the organic phase comprising a solution of the corresponding N-alkylcarbamate in said solvent,

(3) stripping said solvent from the organic phase resulting from step (2),

(4) pyrolyzing the bottoms product of step (3) and selectively condensing and collecting said alkyl isocyanate.

4,123,451
PREPARATION OF ESTERS

Roger A. Sheldon, and Peter Been, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

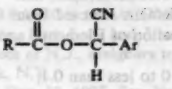
Filed Feb. 3, 1977, Ser. No. 765,188

Claims priority, application United Kingdom, Mar. 1, 1976, 8046/76

Int. Cl.[2] C07C *120/00, 121/66, 120/04*

U.S. Cl. 260—465 D 13 Claims

1. A process for the preparation of an ester of formula I



(I)

wherein Ar is a phenoxy substituted phenyl group and R is a branched-chain alkyl group substituted by a halophenyl group, which process comprises contacting an aromatic aldehyde of the formula ArC(O)H and an acyl halide of the formula RC(O)Hal, in which formulas Ar and R have the same meaning as in formula I and Hal represents a halogen atom having an atomic number of from 9 to 53, inclusive, with water and water-soluble cyanide in the presence of at least one substantially water-immiscible alkane solvent containing from 6 to 10 carbon atoms or mixture thereof and recovering the desired ester product from the reaction mixture.

4,123,452
STYRYL DYESTUFFS

Hermann Beecken, Bergisch-Gladbach, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

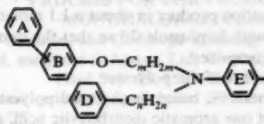
Filed Mar. 11, 1977, Ser. No. 776,658

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1976, 2610674

Int. Cl.[2] C07C *121/78;* C09B *23/14*

U.S. Cl. 260—465 E 8 Claims

1. Styryl dyestuff of the formula



wherein

the phenyl nuclei A, B, D and E can each be substituted by 1 or 2 radicals from the series methyl, ethyl, trifluoromethyl, methoxy, ethoxy and halogen,

m denotes the numbers 2 or 3 and

n denotes the numbers 1–3.

4,123,453
PROCESS FOR THE MANUFACTURE OF ACRYLONITRILE AND METHACRYLONITRILE

Robert K. Grasselli, Garfield Heights; Arthur F. Miller, Cleveland, and Harley F. Hardman, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 112,780, Feb. 4, 1971, abandoned. This application Jan. 24, 1977, Ser. No. 761,829

Int. Cl.[2] C07C *120/14*

U.S. Cl. 260—465.3 13 Claims

1. In the process for the conversion of an olefin selected from the group consisting of propylene, isobutylene and mixtures thereof, to acrylonitrile, methacrylonitrile and mixtures thereof respectively by reacting in the vapor phase at a temperature of from about 500° to 1100° F. and at a pressure of from about 0.5 to 5 atmospheres said olefin with a molecular oxygen-containing gas and ammonia in the presence of an oxide catalyst, the improvement comprising:

conducting the reaction in the presence of a catalyst selected from the group of those catalysts having atomic ratios described by the empirical formula:

$$A_a B_b C_c D_d Fe_e Bi_f Mo_g O_x$$

wherein

A is an alkali metal;

B is one or more of the elements selected from the group consisting of nickel and cobalt;

C is phosphorus or arsenic or both; and
D is at least one element selected from Group IIB of the Periodic Classification of Elements; and
wherein
a is a number from 0 to less than 0.1;
b is a number from 0 to 12;
c is a number from 0 to 3;
d is a number from 0.1 to 10;
e and *f* are each a number from 0.1 to 6;
g is a number from 8 to 16; and
x is a number determined by the valence requirements of the other elements present.

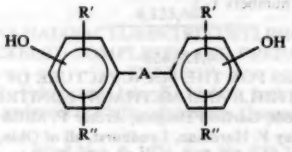
4,123,454

THERMOPLASTIC COPOLYESTERS

Lothar Buxbaum, Lindenfels, Odenwald, Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,281
Claims priority, application Switzerland, Oct. 7, 1976, 12701/76
Int. Cl.[2] C08G *63/18*
U.S. Cl. 260—22 D **13 Claims**

1. A linear thermoplastic copolyester which has a relative viscosity of at least 1.3, measured on a solution of 1 gram of polyester in 100 ml of solvent consisting of equal parts of phenol and symmetrical tetrachloroethane at 30° C., which comprises the condensation product in about a 1:1 molar ratio of diacids (a) and (c) with bisphenols (b) so that the composition of the polyester comprises
in the diacid component of the polyester
(a) from 49.5 to 45 mol %, based on the total polyester, of radicals of at least one aromatic dicarboxylic acid, and
(c) from 0.5 to 5 mol %, based on the total polyester, of radicals of one or more dimer acids; and in the bisphenol component of the polyester
(b) 50 mol %, based on the total polyester, of radicals of at least one bisphenol of the formula I



(I)

wherein R' and R'' are hydrogen, alkyl of 1 to 6 carbon atoms, chloro or bromo, and A is a direct bond, O, S, SO_2, alkylidene of 2 to 8 carbons atoms, dichloroethylidene, trichloroethylidene, alkylene of 1 to 2 carbon atoms, phenylmethylene, diphenylmethylene or cycloalkylidene of 5 to 8 carbon atoms; wherein the radicals (a) and (c) are attached to the radicals (b) through ester linkages in a random distribution.

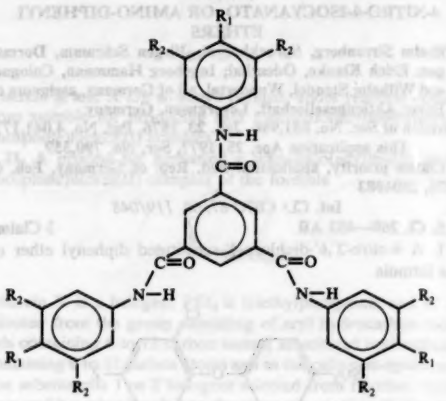
4,123,455

PHENENYLTRIS(CARBONYLIMINO) MULTI-ANIONIC SUBSTITUTED TRIPHENYL ACIDS AND SALTS

Ransom B. Conrow, Pearl River, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 13, 1977, Ser. No. 805,773
Int. Cl.[2] C07C *143/52*; A61K *31/245*
U.S. Cl. 260—507 R **2 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen; and R_2 is SO_3R_3, wherein R_3 is selected from the group consisting of alkali metal and alkali earth metal; and the pharmaceutically acceptable salts thereof.

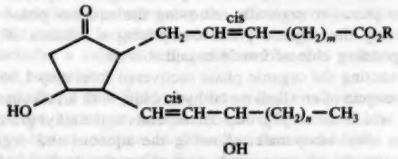
4,123,456

NOVEL 11-HYDROXY-9-KETO-5,6-CIS-13,14-CIS-PROSTADIENOIC ACID DERIVATIVES

Karel F. Bernady, Belle Mead, N.J.; Middleton B. Floyd, Jr., Suffern; John F. Poletto, Nanuet, both of N.Y.; Robert E. Schaub, Upper Saddle River, and Martin J. Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 521,719, Nov. 7, 1974, abandoned, which is a continuation of Ser. No. 355,352, Apr. 27, 1973, abandoned. This application Feb. 17, 1977, Ser. No. 769,764
Int. Cl.[2] C07C *177/00*
U.S. Cl. 562—503 **9 Claims**

1. A compound selected from the group consisting of an optionally active compound of the formula:



and a racemic compound of that formula and the mirror image thereof wherein *m* is an integer from 2 to 5, inclusive, and *n* is an integer from 3 to 6, inclusive, R is selected from the group consisting of hydrogen and C_1–C_4 alkyl; and the pharmacologically acceptable cationic salts thereof.

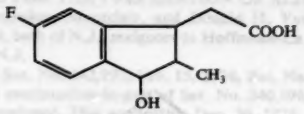
4,123,457

2-METHYL-5-FLUORO-INDANOL-3-ACETIC ACID

Roger J. Tull, Metuchen, and David G. Melillo, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 511,349, Oct. 2, 1974, Pat. No. 3,998,875. This application Sep. 22, 1976, Ser. No. 725,593
Int. Cl.[2] C07C *65/14*
U.S. Cl. 562—466 **1 Claim**

1. A compound of the formula:



4,123,458

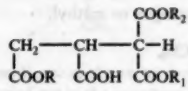
PREPARATION OF CIS AND TRANS ACONITIC ACIDS AND THEIR SALTS

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

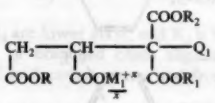
Filed Dec. 22, 1975, Ser. No. 642,850
Int. Cl.[2] C07C *51/38*
U.S. Cl. 562—595 5 Claims

1. A process for preparing aconitic acid, salts of aconitic acid and mixtures thereof comprising:

a. halogenating, in an aqueous medium at a pH of less than about 8 with a halogenating agent which is hypochlorous acid, hypobromous acid or a solution of a substance capable of forming hypochlorous acid or hypobromous acid selected from the group consisting of chlorine, bromine and alkali and alkaline earth metal hypochlorites and hypobromites, a compound of the general formula

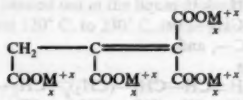


wherein R and R_2 are independently primary alkyl groups of 1 to 4 carbon atoms and R_1 is a primary alkyl group of 1 to 4 carbon atoms, a lithium, a sodium, or potassium cation; to produce a halogenated compound of the general formula



wherein said R, said R_1 and said R_2 are as previously defined, wherein M_1 is hydrogen or a lithium, sodium, potassium, magnesium, calcium, strontium or barium cation, wherein x is either 1 or 2 and corresponds to the valency of said M_1 and wherein said Q_1 is chlorine or bromine;

b. heating said halogenated compound in an aqueous medium at a pH of about 11 to about 12 to produce a propene-1,1,2,3-tetracarboxylate compound of the general formula



wherein M is a cation selected from the group consisting of calcium, strontium, barium, lithium, sodium and potassium and wherein x is a previously defined;

c. lowering the pH of the aqueous medium containing the tetracarboxylate compound to about 8 or less to cause decarboxylation of said tetracarboxylate compound, producing cis and trans aconitic acids, salts of cis and trans aconitic acids or a mixture of the acid and salt forms of cis and trans aconitic acids depending on the pH selected for the decarboxylation.

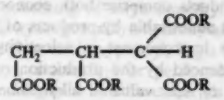
4,123,459

PREPARATION OF ACONITIC ACID

Eddie N. Gutierrez, Fort Lee, and Vincent Lamberti, Upper Saddle River, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,840
Int. Cl.[2] C07C *51/38*
U.S. Cl. 562—595 6 Claims

1. A process for preparing aconitic acid comprising: chlorinating a tetraester compound of the formula



wherein R independently represents a lower primary alkyl group of 1 to 4 carbon atoms in an aqueous medium, with hypochlorous acid at a pH of about 2 to about 8 to form a chlorinated tetraester; dehydrohalogenating and saponifying said chlorinated tetraester in an aqueous medium with magnesium hydroxide at a pH of less than about 9 to form an aqueous mixture of magnesium aconitate and acidifying said aqueous mixture with a mineral acid to a pH of less than 2 to form said aconitic acid.

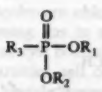
4,123,460

PROCESS FOR THE PRODUCTION OF MONOHALOACETYLHALIDES

Barry Jackson, and Christoph Zinsstag, both of Visp, Switzerland, assignors to Lonza, Ltd, Gambel, Switzerland

Filed Sep. 28, 1977, Ser. No. 837,437
Claims priority, application Switzerland, Sep. 28, 1976, 12234/76
Int. Cl.[2] C07C *51/58*
U.S. Cl. 260—544 D 9 Claims

1. Process for the production of a monohaloacetylhalide characterized in that (a) $CH_2{=}C{=}O$, $R_4CH{=}C{=}O$ or $R_4R_5C{=}C{=}O$, wherein R_4 and R_5 can be the same or different and are aryl or alkyl having 1 to 6 carbon atoms, is reacted with (b) a halogen in the presence of a diester of phosphonic acid of the formula:



wherein R_1, R_2 and R_3 are the same or different alkyl or aryl, or R_1 and R_2 are the same or different alkyl or aryl and R_3 is —COOR or $-CH_2COOR$, wherein R is alkyl or aryl, the reaction being conducted in the liquid phase at a temperature between about −50° and about 100° C.

4,123,461

BENZENE-TRICARBOXYLIC ACID-(1,3,5)-TRI-N-CHLORAMIDE AND PROCESS FOR THE PREPARATION THEREOF

Hans-Georg Zengel, Kleinwallstadt, and Manfred Bergfeld, Erlenbach both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 651,089, Jan. 21, 1976, Pat. No. 4,057,588. This application Apr. 28, 1977, Ser. No. 791,811
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1975, 2502429
Int. Cl.[2] C07C *103/24, 39/10*
U.S. Cl. 260—558 A 2 Claims

1. Benzene-tricarboxylic acid-(1,3,5)-tri-N-chloramide.

4,123,462

AMINATION PROCESS USING NICKEL-RHENIUM CATALYSTS

Donald C. Best, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 7, 1976, Ser. No. 647,065
Int. Cl.[2] C07C *85/00, 85/02, 85/06, 85/08*
U.S. Cl. 260—585 B **16 Claims**

1. In the process for aminating a lower aliphatic alkane derivative with ammonia in the presence of a solid catalyst wherein the products comprise both economically desirable alkylamines and undesirable by-products of lesser economic significance, the improvement in selectivity and increased conversion, evidenced by the production of a substantially greater amount of said valuable alkylamines together with concomitant reduction in the yield of undesirable by-products from a given alkane charge, which comprises reacting under amination conditions said alkane charge with ammonia in the presence of hydrogen and a nickel-rhenium catalyst comprising rhenium and nickel impregnated on a support material selected from the group consisting of aluminas, silicas, silica-aluminas, kieselguhrs or diatomaceous earths and silica-titanias, wherein said catalyst has a total nickel and rhenium metal content of 3–30% by weight of the support and the atom ratio of the nickel to the rehnium present is in the range from about 2:1 to about 30:1.

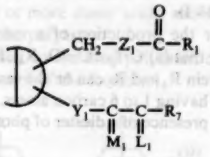
4,123,463

2-DECARBOXY-2-ALKYLKETONE PROSTAGLANDINS

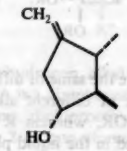
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

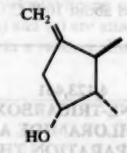
Filed Mar. 21, 1978, Ser. No. 888,695
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—586 R **47 Claims**

1. A prostaglandin analog of the formula



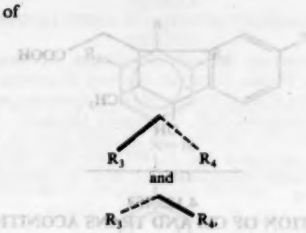
wherein D is



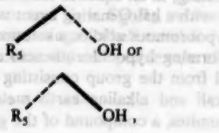


wherein R_1 is alkyl of one to 4 carbon atoms, inclusive; wherein L_1 is

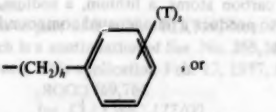
a mixture of



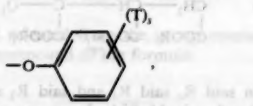
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein M_1 is



wherein R_5 is hydrogen or methyl;
wherein R_7 is
(1) $-(CH_2)_m-CH_3$,



(2)



(3)

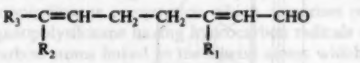
wherein *h* is zero to three, inclusive,
wherein *m* is one to 5, inclusive, *s* is zero, one, 2, or 3 and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms or alkoxy of one to 3 carbon atoms, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl;
wherein Y_1 is
(1) trans—CH=CH—
(2) cis—CH=CH—,
(3) $—CH_2CH_2—$, or
(4) —C≡C—; and
wherein Z_1 is
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—, (3) cis—CH-$_2$—CH=CH—$(CH_2)_g$—CH_2—,
(4) $—(CH_2)_3—(CH_2)_g—CH_2—$,
(5) $—(CH_2)_3—(CH_2)_g—CF_2—$,
(6) $—CH_2—O—CH_2—(CH_2)_g—CH_2—$,
(7) $—(CH_2)_2—O—(CH_2)_g—CH_2—$,
(8) $—(CH_2)_3—O—(CH_2)_g—$,
(9) $—C≡C—CH_2—(CH_2)_g—CH_2—$,
(10) $—CH_2—C≡C—(CH_2)_g—CH_2—$, or
(11) trans-$(CH_2)_2—(CH_2)_g—CH=CH—$,
wherein *g* is one, two, or three.

4,123,464
PREPARATION OF ALDEHYDES

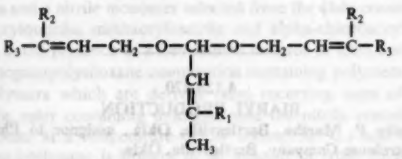
Willy Leimgruber, Montclair, and Donald H. Valentine, Jr., Westfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 442,991, Feb. 15, 1974, Pat. No. 4,016,212, which is a continuation-in-part of Ser. No. 340,496, Mar. 12, 1973, abandoned. This application Dec. 30, 1976, Ser. No. 755,693
Int. Cl.[2] C07C *47/20*
U.S. Cl. 260—601 R 3 Claims

1. A process for producing a compound of the formula:

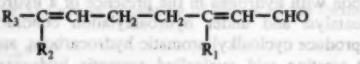


wherein R_1 and R_2 are lower alkyl; and R_3 is hydrogen, lower alkyl or a linear or branched chain aliphatic hydrocarbon containing from 2 to 8 carbon atoms and from 1 to 2 double bonds;
comprising subjecting an acetal of the formula:

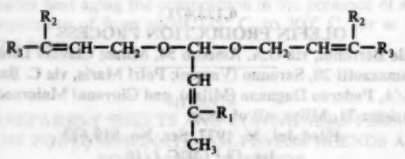


wherein R_1, R_2 and R_3 are as above; to pyrolysis wherein said pyrolysis is carried out in the gas phase at a temperature of from about 200° C. to 400° C.

2. A process for producing a compound of the formula:



wherein R_1 and R_2 are lower alkyl; and R_3 is hydrogen, lower alkyl or a linear or branched chain aliphatic hydrocarbon containing from 2 to 8 carbon atoms and from 1 to 2 double bonds;
comprising subjecting an acetal of the formula:



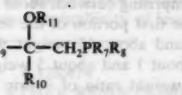
wherein R_1, R_2 and R_3 are as above; to pyrolysis wherein the pyrolysis is carried out in the liquid phase at a temperature of from about 120° C. to 230° C. in the presence of an acid catalyst.

4,123,465
CHIRAL TERTIARY PHOSPHINES

Donald H. Valentine, Jr., Westfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 623,140, Oct. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,442, Oct. 31, 1974, abandoned. This application Aug. 10, 1977, Ser. No. 823,373
Int. Cl.[2] C07F *9/50*
U.S. Cl. 260—606.5 P 10 Claims

1. A chiral phosphine of the formula:



wherein R_7 is methyl, isopropyl, xylyl, mesityl, benzyl, aryl or a substituted aryl selected from the group consisting of tolyl, ethylphenyl, cyclohexylphenyl, dimethylphenyl and methoxyphenyl; R_8 is lower alkyl, aryl or a substituted aryl selected from the group consisting of tolyl, dimethylphenyl and methoxyphenyl; R_9 is hydrogen, alkyl, hydroxylalkyl, aminoalkyl, perfluoroalkyl, aryl or methoxyphenyl; R_{10} is hydrogen, alkyl, aryl, hydroxyalkyl, aminoalkyl or perfluoroalkyl, with the proviso that R_9 and R_{10} must be different; R_{11} is hydrogen, alkyl or aryl.

4,123,466
PROCESS FOR NITRATING AROMATIC HYDROCARBONS

Chung-Yuan Lin, Northford; Fred A. Stuber, North Haven, and Henri Ulrich, Northford, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 12, 1977, Ser. No. 859,388
Int. Cl.[2] C07B *11/00*
U.S. Cl. 260—645 12 Claims

1. In a process for the nitration of an aromatic hydrocarbon the improvement which comprises reacting said hydrocarbon with gaseous nitrogen dioxide in the presence of a catalytic amount of sulfuric acid and in the substantial absence of oxygen at a temperature of about 50° C to about 150° C.

4,123,467
OXYCHLORINATION OF ETHYLENE

Ramsey G. Campbell, Berkeley; Elliott P. Doane, Moraga; M. Henry Heines, Oakland; Joseph S. Naworski, Martinez, and Harvey J. Vogt, Lafayette, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 595,465, Jul. 14, 1975, abandoned. This application May 14, 1976, Ser. No. 686,333
Int. Cl.[2] C07C *17/15*
U.S. Cl. 260—659 A 31 Claims

1. A process for the oxychlorination of ethylene in a fixed bed comprising the steps of:

(a) reacting ethylene, hydrogen chloride and a first portion of an oxygen-containing gas in a first reaction zone in contact with a first catalyst bed substantially undiluted by catalytically inert particles and comprising cupric chloride and potassium chloride supported on spherical particles of activated alumina, the first catalyst bed being divided into two portions in the direction of flow of reactants therethrough, the first portion comprising between about 45% and about 75% of the bed, the second portion comprising between about 25% and about 55% of the bed, the first portion comprising 4.5 and about 12.5 weight % cupric chloride and between about 1.5 and about 7 weight % potassium chloride, in a weight ratio of cupric chloride to potassium chloride of between about 1.5:1 and about 4:1, the second portion comprising between about 12 and about 25 weight % cupric chloride and between about 0.5 and about 4 weight % potassium chloride, in a weight ratio of cupric chloride to potassium chloride of between about 5:1 and about 15:1;

(b) reacting the product of step (a) and a second portion of an oxygen-containing gas in a second reaction zone in contact with a second catalyst bed substantially undiluted by catalytically inert particles and comprising cupric chloride and potassium chloride supported on spherical particles of activated alumina, the second catalyst bed being divided into two portions in the direction of flow of reactanta therethrough, the first portion comprising between about 45% and about 75% of the bed, the second

portion comprising between about 25% and about 55% of the bed, the first portion of the bed comprising between about 5.5 and about 15 weight % cupric chloride and between about 1 and about 5 weight % potassium chloride, in a weight ratio of cupric chloride to potassium chloride of between about 2:1 and about 6:1, the second portion of the bed comprising between about 12 and about 25 weight % cupric chloride and between about 0.5 and about 4 weight % potassium chloride, in a weight ratio of cupric chloride to potassium chloride of between about 5:1 and about 15:1, the weight ratio of cupric chloride to potassium chloride in the first portion of the bed being lower than that in the second portion of the bed; and

(c) reacting the product of step (b) and a third portion of an oxygen-containing gas in a third reaction zone in contact with a third catalyst bed substantially undiluted by catalytically inert particles and comprising between about 12 and about 25 weight % cupric chloride and between about 0.5 and about 4 weight % potassium chloride, supported on spherical particles of activated alumina, in a weight ratio of cupric chloride to potassium chloride of between about 5:1 and about 15:1.

4,123,468

TITANIUM TETRACHLORIDE AS HETEROGENEOUS CATALYST FOR ISOMERIZATION OF ALKYLAROMATIC HYDROCARBON

Ji-Yong Ryu, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 644,783, Dec. 29, 1975, Pat. No. 4,048,247. This application Apr. 21, 1977, Ser. No. 789,755
Int. Cl.[2] C07C *5/28*
U.S. Cl. 260—668 A **5 Claims**

1. A process for the isomerization of an alkylaromatic hydrocarbon which comprises contacting the alkylaromatic hydrocarbon at isomerization conditions in the presence of a catalyst system consisting essentially of titanium tetrachloride on an activated Group III-A metal oxide having surface hydroxyl groups, said catalyst system having been prepared by passing $TiCl_4$ vapor with an inert gas over said metal oxide at a temperature of 20° C. to 400° C. for 1 to 10 hours and thereafter thermally treating the resultant $TiCl_4$-containing oxide in an inert atmosphere at a temperature of from about 135° C. to about 550° C.

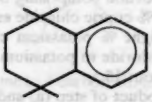
4,123,469

PROCESS FOR PRODUCTION OF BICYCLIC COMPOUNDS

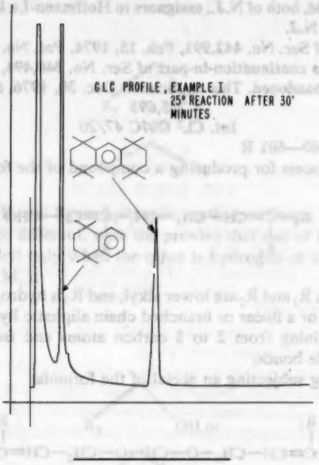
Mark A. Sprecker, Sea Bright, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,616
Int. Cl.[2] C11B *9/00*
U.S. Cl. 260—668 F **4 Claims**

1. The process for preparing 1,1,4,4-tetramethyltetrahydronaphthalene having the structure:



comprising the step of reacting benzene with 2,5-dimethylhexane-2,5-diol in the presence of an aluminum chloride catalyst (i) in a first stage at a temperature in the range of from about 15° C up to about 25° C and (ii) in a second stage sequentially following said first stage at a temperature in the range of from about 25° C up to the reflux temperature of the reaction mass; said benzene being in molar excess with respect to said diol compound whereby the mole ratio of said benzene:diol compounds in the range of from about 15:1 up to about 50:1.



4,123,470

BIARYL PRODUCTION

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 6, 1977, Ser. No. 804,125
Int. Cl.[2] C07C *15/14*
U.S. Cl. 260—668 D **8 Claims**

1. A process for the production of biaryl compounds from monocyclic aromatic hydrocarbons which comprises:

(a) contacting at least one monocyclic aromatic hydrocarbon with hydrogen in the presence of a hydroalkylation catalyst and under hydroalkylation conditions which produce cycloalkyl aromatic hydrocarbons, and

(b) treating said cycloalkyl aromatic hydrocarbons produced in (a) with hydrogen in the presence of a metal dehydrogenation catalyst on an acidic support and under dehydrogenation conditions which produce biaryl compounds substantially free of by-product triaryls and higher ring assemblies.

4,123,471

OLEFIN PRODUCTION PROCESS

Natale Bertolini, via G.A. Amedeo 54, Milan; Claudio Divo, via Ramazzotti 20, Saronno (Varese); Petri Maris, via C. Battisti 23/A, Paderno Dugnano (Milan), and Giovanni Maiorano, via Assietta 31, Milan, all of Italy

Filed Jul. 26, 1977, Ser. No. 819,613
Int. Cl.[2] C07C *3/16*
U.S. Cl. 260—683.15 C **14 Claims**

1. A process for preparing C_7–C_9 olefins from a mixture of propylene and butenes, over a supported phosphoric acid catalyst, comprising the steps of

feeding a stream comprising propylene, butenes and recycle olefins beyond C_9 to one end of an adiabiatic reaction zone containing the catalyst;

carrying out the operation in said zone at a temperature of 160° to 300° C. and under a pressure such as to maintain the reagents and reaction products in the homogeneous liquid phase, until at least 30% but not more than 70% of the fed propylene and butenes has been converted;

recovering the reaction products at the other end of the reaction zone, and separating the unconverted propylene and butenes, the C_6 olefins, the C_7–C_9 fraction and the fraction beyond C_9

and at least partially recycling the latter fraction to that end of the reaction zone to which the reagents are fed.

4,123,472

OIL RESISTANT MODIFIED SILICONE COMPOSITION

J. Charles Getson, Adrian, Mich., and Patrick J. Adams, Valley City, Ohio, assignors to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 610,583, Sep. 5, 1975, abandoned, which is a continuation of Ser. No. 447,442, Mar. 1, 1974, abandoned, which is a continuation of Ser. No. 862,045, Sep. 29, 1959, abandoned. This application Dec. 18, 1975, Ser. No. 642,082

Int. Cl.[2] C08L *83/10, 43/04*

U.S. Cl. 260—827 6 Claims

1. A method for imparting oil resistant properties to a modified organopolysiloxane composition which comprises reacting a diorganopolysiloxane having hydrocarbon radicals with up to 18 carbon atoms linked to the silicon atoms which are selected from the class consisting of monovalent hydrocarbon radicals, halogenated monovalent hydrocarbon radicals and cyanoalkyl radicals and having terminal groups selected from the class consisting of aliphatic unsaturated groups and hydroxyl groups with a mixture containing an acrylic ester monomer selected from the class consisting of alkyl acrylates and methacrylates in which the alkyl group has from 1 to 4 carbon atoms and a nitrile monomer selected from the class consisting of acrylonitrile, methacrylonitrile and alpha-chloroacrylonitriles in the presence of a free-radical initiator to form a modified organopolysiloxane composition containing polymers and copolymers which are derived from recurring units of the acrylic ester containing monomer and the nitrile containing monomer at a temperature below about 150° C., said diorganopolysiloxane is present in an amount of from 25 to 75 percent by weight based on the weight of the diorganopolysiloxane and acrylic ester and nitrile monomers and said nitrile monomer is present in an amount of from 5 to 95 mol percent based on the nitrile and acrylic ester monomers and when said modified organopolysiloxane contains terminal hydroxyl groups, then a cross-linking agent is added which is selected form the group consisting of silanes of the formula

$$X_{4-m}SiY_m \text{ and}$$

siloxanes in which the silicon atoms are linked through Si-O-Si linkages, wherein X is selected from the group consisting of alkyl and aryl radicals, Y is selected from the group consisting of acyloxy, oximo, alkoxy, aryloxy, halogen, aminoxy, amido and phosphato groups and *m* is a number of from 2 to 4, curing said composition in the presence of atomspheric moisture and thereafter heat aging the composition in the presence of air at a temperature of from about 125° C. to 300° C. for at least about 4 hours.

4,123,473

TRANSPARENT SHEETS AND CONTAINERS FORMED FROM POLYCARBONATE-POLYESTER BLENDS AND FORMATION THEREOF

Surendra A. Amin, Pottsville; Phillip S. Bollen, Auburn, both of Pa., and William Sacks, Gillette, N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 625,299, Oct. 23, 1975, abandoned. This application Nov. 5, 1976, Ser. No. 739,214

Int. Cl.[2] C08L *67/02*

U.S. Cl. 260—860 6 Claims

1. A sheet suitable for use in hot filling of foods and being formed from a uniform blend of from about 80 to 97% by weight of polyethylene terephthalate having an intrinsic viscosity of about 0.9 as measured in a mixed solvent of 60 parts by weight phenol and 40 parts by weight tetrachloroethane at 25° C, and a melt viscosity at 525° F of above about 10,000 poises and correspondingly from about 20 to 3% by weight of a polycarbonate resin having an intrinsic viscosity of about 0.4 to 0.6, as measure in dioxane at 30° C, and a melt viscosity of 500° F. of less than 50,000 poises said sheet being non-oriented having a haze value as determined by ASTM D-1003 of less than about 2% wherein the polyethylene terephthalate portion of the sheet has a degree of crystallinity of less than 5%.

4,123,474

POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING A DIPHENYLAMINE

Arthur Katchman, Delmar, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1975, Ser. No. 638,803

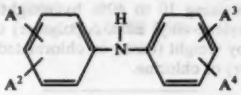
Int. Cl.[2] C08L *25/06, 71/04*

U.S. Cl. 260—874 18 Claims

1. A stabilized thermoplastic molding composition which consists essentially of:

(a) a polyphenylene ether resin or a polyphenylene ether resin in combination with an alkenyl aromatic resin;

(b) a stabilizing amount of a diphenylamine of the formula:



wherein A^1, A^2, A^3 and A^4 are independently selected from the group consisting of hydrogen, halogen, hydrocarbon radicals, halohydrocarbon radicals, hydrocarbonoxy radicals, halohydrocarbonoxy radicals and mixtures of said diphenylamines.

4,123,475

ANTISTATIC POLYPHENYLENE ETHER COMPOSITIONS

Visvaldis Abolins, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1977, Ser. No. 865,322

Int. Cl.[2] C08L *71/04*

U.S. Cl. 260—874 9 Claims

1. An antistatic thermoplastic composition which comprises:

(a) a polyphenylene ether resin with or without a styrene resin, and

(b) a minor, effective amount of an antistatic agent consisting of a mixture of triethanolamine, toluene sulfonic acid and sodium lauryl sulfate.

4,123,476

REINFORCED PLASTIC MATERIAL AND A PROCESS FOR THE PRODUCTION THEREOF

Alain Bonnefon, Epinay-sur-Seine; Alain Coupard, Asnieres, and Michel Maffre, Versailles, all of France, assignors to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, France

Continuation-in-part of Ser. No. 463,186, Apr. 22, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,307

Claims priority, application France, Apr. 20, 1973, 73.14721

Int. Cl.[2] C08L *23/06, 23/08*

U.S. Cl. 260—897 A 4 Claims

1. A flexible anisotropic plastic material having in a longitudinal direction a resistance to breaking higher than 400 kg/cm^2 with a breaking elongation lower than 10% and an elasticity modulus at least 8 times greater than the elasticity modulus in the other transversal directions perpendicular to said longitudinal direction; said flexible plastic material comprising a matrix of thermoplastic material and 5–100 parts by weight of a reinforcing polymer which is not miscible with said matrix, said polymer consisting of a crystalline polyethylene having a molecular weight at least equal to 500,000 and being in the form of elongated fibrils having a diameter less than 5 microns, a length greater than 2 mm. and a dominant orientation in the longitudinal direction; said thermoplastic material forming the matrix having a lower softening point than the melting point of the reinforcing polyethylene and said thermoplastic material of the matrix being selected from the group consisting of polyvinyl chloride, polyethylene having a low

molecular weight and an ethylene and vinyl acetate or vinyl chloride copolymer.

4,123,477

POLYVINYLIDENE CHLORIDE RESIN COMPOSITIONS

Takeshi Watanabe, and Kenichiro Kodama, both of Nobeoka, Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Nov. 4, 1977, Ser. No. 848,521

Claims priority, application Japan, Nov. 9, 1976, 51-133735

Int. Cl.² C08L *23/28*

U.S. Cl. 260—897 C **6 Claims**

1. A polyvinylidene chloride resin composition, which comprises 100 parts by weight of (A) a copolymer of 75 to 75% by weight of vinylidene chloride and 25 to 5% by weight of a monomer copolymerizable with vinylidene chloride and 3 to 60 parts by weight of (B) a chlorinated ethylene-vinyl ester copolymer containing 10 to 40% by weight (based on unchlorinated ethylene-vinyl ester copolymer) of a vinyl ester and 3 to 55% by weight (based on chlorinated ethylene-vinyl ester copolymer) of chlorine.

4,123,478

PREPARATION OF O, O-DIMETHYL-O-(2,2-DICHLOROVINYL)-THIONO-PHOSPHORIC ACID ESTER

Reimer Cölln, Wuppertal, and Wilhelm Sirrenberg, Sprockhoevel, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

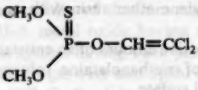
Filed Jul. 29, 1977, Ser. No. 820,500

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1976, 2636786

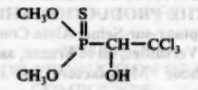
Int. Cl.² C07F *9/165*

U.S. Cl. 260—986 **7 Claims**

1. A process for the preparation of O,O-dimethyl-O-(2,2-dichlorovinyl)-thionophosphoric acid ester of the formula



comprising reacting O,O-dimethyl-1-hydroxy-2,2,2-trichloroethanethionophosphonic acid ester of the formula



in isopropanol with a concentrated aqueous solution of an alkali metal hydroxide.

4,123,479

CARBURETOR CONTROLLED BY A SLIDING MOVEMENT

Anders O. Andreassen, Alphyddevägen 21, S-131 00 Nacka, Sweden

Filed Jan. 25, 1977, Ser. No. 762,785

Claims priority, application Sweden, Jan. 28, 1976, 7600870; Nov. 1, 1976, 7612117

Int. Cl.² F02M *9/06*

U.S. Cl. 261—44 B **9 Claims**

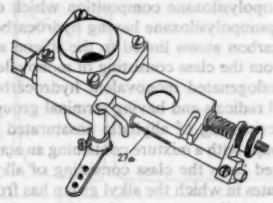
1. A carburetor for a combustion engine comprising:

a housing having a venturi tube defining a flow passage,

means for supplying air through said venturi tube including a member having an aperture in registration with said venturi tube and forming part of the flow passage through the venturi tube, said member being carried by said housing for translational movement whereby the size of the flow passage and consequent flow through said venturi tube is controlled in accordance with the translational position of said member relative to said venturi tube,

means carried by said housing for supplying fuel through the carburetor and defining a fuel path including an elongated opening in said housing,

means carried by said housing for controlling the flow of fuel through said fuel supply means including an elongated movable plunger in said opening having a longitudinally extending groove along its outer surface, at least a portion of said groove forming part of said fuel path and which groove extends monotonically in the direction of the longitudinal extent of said plunger, said plunger having a first end within said opening and defining a chamber therewith in said fuel path and which chamber decreases in volume in response to movement of said plunger inwardly of said housing,



means coupling the opposite end of said plunger and said member one to the other for conjoint movement, said groove in said plunger having a cross section diminishing in the direction toward said first plunger end so that, when the fuel and air supply are increased by conjoint movement of said plunger and said member, the volume of said chamber decreases to cause an increase of fuel pressure with accompanying richer fuel mixture.

4,123,480

THROTTLE CONTROL MECHANISM FOR A CARBURETOR

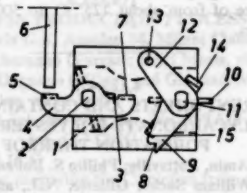
Rolf A. G. Johansson, Unnaryd, Sweden, assignor to Jonsereds AB, Partille, Sweden

Filed Feb. 14, 1977, Ser. No. 768,378

Claims priority, application Sweden, Feb. 16, 1976, 76 016799

Int. Cl.² F02M *1/02*

U.S. Cl. 261—52 **6 Claims**



1. A control mechanism for a fuel/air mixing apparatus having a throttle valve and a choke valve, said valves each having an idling position, a cold starting position and a full speed position, said control mechanism including first biasing means biasing said throttle valve toward its idling position, second biasing means biasing said choke valve toward its full speed position, interengageable means associated with the respective valves for holding both valves in their cold starting positions in opposition to the biasing means upon movement of said choke valve from its idling position toward its full speed position and further means associated with the throttle valve for releasing said interengageable means by movement of the throttle valve from its cold starting position toward its full speed position.

4,123,481

DEVICE FOR CARBURETION OF LIQUID FUELS

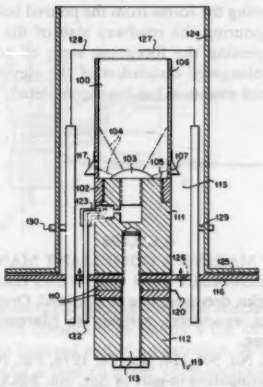
Wilhelm Herold, Biebererstr. 27, D-6055 Hausen, and Johannes Pickert, Fichtenweg 2, D-6057 Dietzenbach, both of Germany

Continuation of Ser. No. 569,609, Apr. 21, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 821,023

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1975, 2507495

Int. Cl.[2] F02M 27/08

U.S. Cl. 261—81 9 Claims



1. A device for carburetion of liquid fuels comprising:

an airflow tube;

an oscillatory body disposed within said tube, said body terminating in a cup-shaped portion opening toward the down-stream end of said airflow tube, said cup-shaped portion having at least one air inlet opening through the side wall thereof;

an electro-mechanical transducer coupled to said oscillatory body;

a fuel supply nozzle disposed in the bottom of said cup-shaped portion for spraying fuel onto the inner walls thereof;

means affording connection of said nozzle to a source of liquid fuel under pressure; and

means for connecting said transducer to a source of electrical energy.

4,123,482

MECHANICAL AERATOR

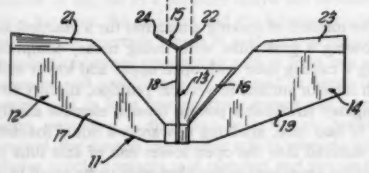
Kenneth L. Wyatt, Oswestry, and Keith J. Ilett, Crewe, both of England, assignors to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Jul. 7, 1977, Ser. No. 813,593

Claims priority, application United Kingdom, Jul. 8, 1976, 28453/76

Int. Cl.[2] B01F 3/04

U.S. Cl. 261—91 3 Claims



1. A mechanical aerator comprising a boss secured to a vertical drive shaft and a plurality of blades secured to said boss, said boss having a vertical axis of rotation, each of said blades extending radially from said axis of rotation and having a body portion and a deflector portion, said body portions being planar and extending in substantially the vertical plane, said deflector portions of said blades being planar and extending from the upper edge of said blade portions upwardly and rearwardly relative to the direction of rotation about said axis wherein the angle between the body portions and the deflector portions is in the range of 100° to 150°.

4,123,483

MANUFACTURING METHOD OF AN OPTICAL WAVEGUIDE

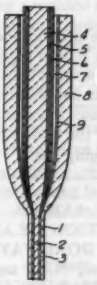
Tsuneo Nakahara; Masao Hoshikawa, both of Yokohama City; Satoshi Shiraishi; Shiro Kurosaki, and Kunio Fujiwara, all of Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Oct. 12, 1973, Ser. No. 406,112

Claims priority, application Japan, Oct. 13, 1972, 47-102839; Oct. 13, 1972, 47-102840

Int. Cl.[2] G02B 5/14

U.S. Cl. 264—1 18 Claims



1. A method of manufacturing an optical waveguide comprising the steps of,

providing an elongated member of fused silica having a smooth cylindrical surface,

forming a layer of fused silica on said smooth surface,

forming a thin layer of doped fused silica having an index of refraction greater than that of said fused silica over said layer of fused silica,

forming a second layer of fused silica over said layer of doped fused silica,

heating the composite structure so formed to the drawing temperature of the materials thereof, and

drawing the heated structure to reduce the cross-sectional area thereof and form an optical waveguide having a cylindrical layer of higher refractive index interposed between a core and an outer cylindrical layer of lesser refractive index.

4,123,484

PROCESS FOR THE REMOVAL OF FISSION-PRODUCT INERT GASES IN THE REPROCESSING OF NUCLEAR FUEL MATERIAL

Harald Schnez, Waldsee, Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Germany

Filed Oct. 13, 1976, Ser. No. 731,990

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1976, 2602897

Int. Cl.[2] G21C 21/00

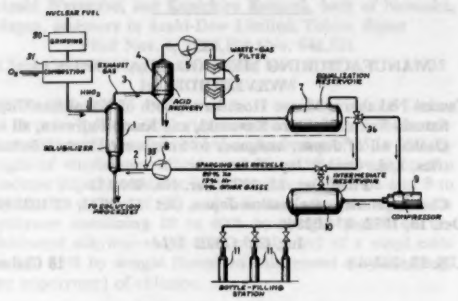
U.S. Cl. 264—0.5 5 Claims

1. A process for treating nuclear fuel material in the form of elements containing graphitic components, comprising the steps of:

comminuting said nuclear fuel elements;

combusting said nuclear fuel elements to burn off graphitic components thereof and form a residue;

chemically solubilizing the residue following the comminution and combustion of said nuclear fuel elements in a digester by contacting said residue with an acid in which said residue is soluble;



passing recycled fission product inert gas as a sparging gas through the solution in said digester to entrain with said sparging gas fission-product inert gases released from said nuclear fuel elements and forming with the released fission-product inert gases a waste gas; and

recycling a portion of the fission-product inert gas to said digester as said sparging gas.

4,123,485

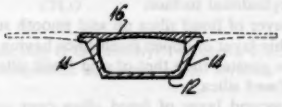
STAGE CONSTRUCTION OF AN ELEVATED BOX GIRDER AND ROADWAY STRUCTURE

Man-Chung Tang, Queens, N.Y., assignor to Dyckerhoff & Widmann Aktiengesellschaft, Munich, Germany

Filed Apr. 20, 1977, Ser. No. 789,223

Int. Cl.[2] E04B *1/16;* E01D *19/12*

U.S. Cl. 264—33 **8 Claims**



1. A method of constructing an elongated roadway structure including a box girder and roadway slab where the box girder includes a bottom slab, upright webs including two laterally spaced outside webs extending upwardly from the bottom slab and defining the outside surfaces of the box girder and a top slab extending transversely across the upper ends of the outside webs and forming a part of the roadway slab, and the roadway slab including two cantilever sections each extending laterally outwardly from an opposite side of the top slab transversely of the elongated direction, comprising the steps of setting up a support structure for a portion of the elongated dimension of the roadway structure, supporting forms for the bottom slab and the two outside webs of the box girder on the support structure so that the opposite ends of the forms for the bottom slab and the two outside webs spaced apart in the elongated direction of the roadway structure rest on the support structure and providing bearing support for the support structure at least adjacent the opposite ends of the support structure spaced apart in the elongated direction of the roadway structure, pouring concrete into the forms for the bottom slab and the outside webs for constructing a first section of the bottom slab and the outside webs and allowing the concrete to set for a predetermined period, removing the support structure and the forms for the bottom slab and the outside webs from the first section after the completion of the predetermined period, supporting forms for the roadway slab from the bottom slab and the outside webs of the first section and pouring concrete into the forms for the roadway slab of the first section, moving the support structure to the next section of the box girder to be constructed, moving the supporting forms for the bottom slab and the outside webs and placing them on the support structure for the next section of the box girder to be constructed, pouring concrete into the form for the bottom slab and the outside webs of the next section, moving the forms for the roadway slab to the next poured section of the bottom slab and outside web and supporting the forms from the poured bottom slab and outside webs, pouring the roadway slab of the next poured section and repeating the foregoing steps of constructing a section of the elongated dimension of the elevated structure until the elevated structure has been completed.

4,123,486

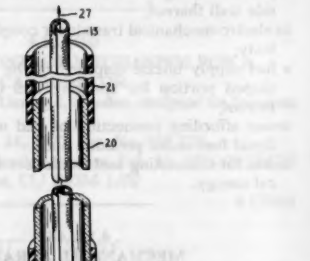
METHOD OF MAKING A COMPLIANT MANDREL IN A MANDREL ASSEMBLY FOR GROWING GRAFT TUBES

Charles H. Sparks, deceased, late of Portland, Oreg. (by Margaret J. Sparks, executrix), assignor to Margaret J. Sparks, Portland, Oreg.

Division of Ser. No. 506,214, Sep. 16, 1974, Pat. No. 3,938,524, which is a continuation-in-part of Ser. No. 368,811, Jun. 11, 1973, Pat. No. 3,866,609, which is a continuation of Ser. No. 241,189, Apr. 5, 1972, abandoned, which is a division of Ser. No. 101,031, Dec. 23, 1970, Pat. No. 3,710,777. This application Aug. 29, 1975, Ser. No. 608,840

Int. Cl.[2] A61B *17/00;* B29D *27/04*

U.S. Cl. 264—46.6 **5 Claims**



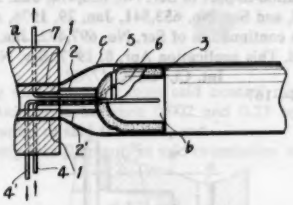
1. The method of making a mandrel for a mandrel assembly for growing a graft tube with living tissue, comprising suspending a casting tube with open upper and lower ends and a smooth interior surface in vertical position, slightly stretching an elongated stretchable porous tension element axially in the center of said tube, injecting upwardly a liquid foamable elastomer material into the open lower end of said tube to cause gas bubbles generated in the elastomer to be small in size and completely enclosed by the elastomer and to prevent the inclusion of air bubbles in the elastomer, causing said elastomer material to set in said tube and impregnate said tension element, and then withdrawing said tension element and elastomer from said tube.

4,123,487

PROCESS FOR PREPARING A TUBULAR ARTICLE OF THERMOPLASTIC RESIN

Shoji Saito, Toyono, Japan, assignor to Shin'Etsu Kasei Kabushiki Kaisha, Nagano, Japan

Continuation of Ser. No. 396,541, Sep. 12, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 624,188
Claims priority, application Japan, Sep. 12, 1972, 47-92039
Int. Cl.² B29D *23/04*
U.S. Cl. 264—90 8 Claims



1. In a process for preparing a tubular article of thermoplastic resin which comprises mounting a die having an annular orifice on the forward end of an extruder, further mounting a mandrel having a desired outer cross-sectional shape on the forward end of the inner core of said die, extruding from said orifice a tube of thermoplastic resin, advancing the tube along the outer surface of said mandrel by pulling out the tube by means of take-up rolls, and cooling said mandrel; an improvement which comprises positioning the mandrel away from the forward end of the inner core, providing the mandrel with a groove in the form of a ring on the outer surface of the mandrel in the vicinity of where the tube begins to contact with the outer surface of the mandrel, forming at least one aperture in the groove, and withdrawing the air in the space between the mandrel and the tube through the aperture and through the interior of the die by reducing the pressure in the space between the mandrel, the die face and the tube wherein the tube contacts the mandrel due to the removal of the air.

3. In an apparatus for forming a tubular article of thermoplastic resin comprising a die having an annular orifice on the forward end of an extuder, a mandrel positioned on the forward end of the inner core of said die, and take-up rolls wherein said tubular article is extruded from said orifice and drawn along the outer surface of said mandrel by said take-up rolls the improvement comprising:

evacuation means for withdrawing the air from the space between the mandrel, the die and the tubular article, said evacuation means comprising:

(a) a groove means formed on the outer surface of said mandrel in the vicinity of where the tube begins to contact the outer surface of the mandrel;

(b) pressure reducing means for reducing the pressure on the exterior of the die to a pressure below the pressure in the space between the mandrel and the tubular article;

(c) at least one aperture means in said groove means; and

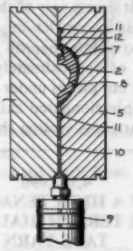
(d) connection means connecting said at least one aperture means in said groove means, and said pressure reducing means, said at least one aperture means and connection means providing a discharge path for air between the mandrel, the die and the tubular article wherein when said tubular article contacts said mandrel and the air therebetween is forced into said groove means and then into said aperture means such that it is discharged therefrom; whereby said tubular article closely contacts the surface of said mandrel, thus forming a smooth surface on said tubular article.

4,123,488

MOLDED PLASTIC ARTICLE AND METHOD OF MAKING THE SAME

David E. Lawson, 701 Riford Rd., Glen Ellyn, Ill. 60137

Filed Sep. 6, 1977, Ser. No. 830,873
Int. Cl.² B29C *5/00;* B29D *3/02;* B29F *1/00*
U.S. Cl. 264—135 11 Claims



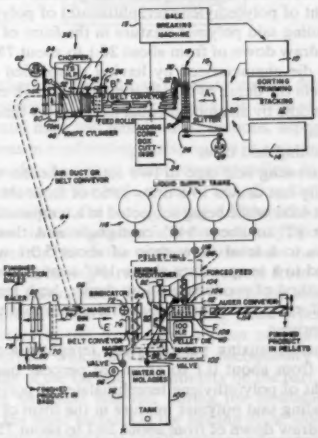
1. A method of making a molded composite structure, comprising the steps of placing in a mold cavity a fibrous material impregnated with an uncured thermosetting resin system capable of being cured by the application of heat, and injecting a molten thermoplastic resin into the mold cavity under pressure and at a temperature above the temperature required to cure the thermosetting resin system, the sensible heat of the thermoplastic resin providing heat required to cause the thermosetting resin system to cure to provide a composite structure having a cured thermosetting resin backing layer and a smooth thermoplastic resin outer surface bonded to the backing layer.

4,123,489

METHOD FOR CONVERTING WASTE PAPER PRODUCTS INTO USEFUL FORMS

Joseph A. Kelley, Chicago, Ill., assignor to Flett Development Company, Chicago, Ill.

Filed May 17, 1977, Ser. No. 797,623
Int. Cl.² B02C *18/44*
U.S. Cl. 264—141 14 Claims



1. A method of converting waste paper materials into a more useful form comprising the steps of:

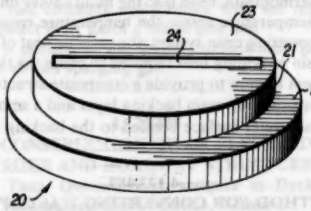
feeding said material in a transverse direction across a cutter bar into the path of helical knives moving in a rotary cylindrical path which is tangent to said cutter bar around a pivot axis parallel thereof for a first phase of linear shear cutting said material moving across said bar into pieces;

second cutting said pieces by passing said pieces out of said cylindrical knife path through the sizing openings in an arcuate recutter screen positioned adjacent a portion of the cylindrical path of said moving knives and having screen cutter bars for a second phase of final shear cutting of said pieces to pass through said sizing openings, said second phase of said final shear cutting producing a plurality of pieces of flat paper materials having random polygonal shapes with at least a pair of shear cut linear edges and a majority of said pieces having a maximum dimension between any two points thereon of 3 inches and a minimum dimension of approximately ¼ inch and extruding said finally shear cut pieces under pressure in an extrusion die having multiple elongated extrusion passages to form pellets of circular cross-section therefrom.

4,123,490
PRODUCTION OF A HIGH TENACITY, LOW DENIER POLY(ETHYLENE TEREPHTHALATE) FIBRILLATED TAPE YARN

John D. Gibbon, Charlotte, N.C., assignor to Fiber Industries Inc., Charlotte, N.C.

Filed Nov. 20, 1975, Ser. No. 633,758
Int. Cl.[2] B29D *7/04, 7/24;* B29C *17/14;* D02G *1/16*
U.S. Cl. 264—147 17 Claims



1. A method of producing a low denier, high tenacity relatively uniformly fibrillatable poly(ethylene terephthalate) tape comprising

a. intimately mixing poly(ethylene terephthalate) polymer with from about 0.1 to about 20 percent based on the weight of poly(ethylene terephthalate) of polypropylene,

b. extruding said polymer mixture in the form of a tape at a melt draw down of from about 26:1 to about 75:1 through a slit die characterized by having a modified entry port wherein the depth of the slit is greater at both ends than at the middle by an amount equal to 0.1 to 0.4 times said slits length,

c. quenching said tape,

d. hot drawing said tape in two stages wherein said tape is initially hot drawn to a draw ratio of from about 3.1:1 to about 4.2:1 while being subjected to a temperature of from about 80° to about 140° centigrade and thereafter hot drawn to a total draw ratio of about 5.0:1 while being heated to a temperature above 160° centigrade.

9. A method of producing a low denier, high tenacity relatively uniformly fibrillated poly(ethylene terephthalate) tape yarn comprising

a. intimately mixing poly(ethylene terephthalate) polymer with from about 0.1 to about 20 percent based on the weight of poly(ethylene terephthalate) of polypropylene,

b. extruding said polymer mixture in the form of a tape at a melt draw down of from about 26:1 to about 75:1 through a slit die characterized by having a modified entry port wherein the depth of the slit is greater at both ends than at the middle,

c. quenching said tape,

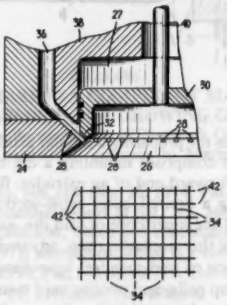
d. hot drawing said tape in two stages wherein said tape is initially hot drawn to a draw ratio of from about 3.1:1 to about 4.2:1 while being subjected to a temperature of from about 80° to about 140° centigrade and thereafter hot drawn to a total draw ratio of about 5.0:1 while being heated to a temperature above 160° centigrade,

e. fibrillating the drawn tape.

4,123,491
PROCESS FOR MANUFACTURING HIGH STRAND COUNT PLASTIC NET

Ronald L. Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation-in-part of Ser. No. 653,474, Jan. 29, 1976, abandoned, and Ser. No. 653,541, Jan. 29, 1976, abandoned, which is a continuation of Ser. No. 697,492, Jan. 12, 1968, abandoned. This application Apr. 8, 1977, Ser. No. 785,862
Int. Cl.[2] B29C *17/02*
U.S. Cl. 264—167 17 Claims



1. A process for the manufacture of oriented high strand count plastic net which comprises the steps of:

(a) extruding a first plurality of plastic strands;

(b) extruding a second plurality of plastic strands to intersect said first plurality of strands at an angle;

(c) extruding the plastic strands sufficiently close together to extrude a structure with a net hole density equivalent to a balanced-net hole density of at least 1200 and thereby cause a portion of the strands between intersections to merge into integrally consolidated joints at the intersections; and

(d) stretching the extruded structure in at least one direction to regenerate and draw out from the integral joints separate lengths of individual strands between the joints to produce high strand count oriented net having a net hole density equivalent to a balanced-oriented net hole density of at least 49.

4,123,492
NYLON 66 SPINNING PROCESS

Michael M. McNamara, Jalisco, Mexico; Wayne T. Mowe, and Darwyn E. Walker, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.

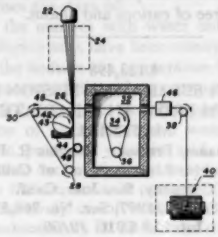
Filed May 22, 1975, Ser. No. 577,951
Int. Cl.[2] D01D *5/12*
U.S. Cl. 264—210 F 40 Claims

1. A process for producing a yarn from a thermoplastic melt-spinnable polyamide polymer, said process comprising:

a. extruding said polymer through a spinneret as a plurality of molten streams into a quench zone wherein the streams are cooled and solidified into spun filaments;

b. forwarding said spun filaments with control means comprising a roll for controlling the spinning speed of said filaments by withdrawing said spun filaments from said

quench zone at a spinning speed of at least 2285 meters per minute;



c. feeding said filaments from said control means into an orientation zone between 0.002 and 0.25 seconds after solidfication of said filaments; and

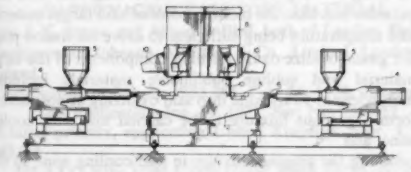
d. stretching said filaments in said orientation zone.

4,123,493

METHOD OF MAKING A SHOE SOLE HAVING A PREFORMED INSERT

Waldemar Schilke, Trenton, and Ladislav Hujik, Batawa, both of Canada, assignors to Bata Shoe Company, Inc., Belcamp, Md.

Filed May 3, 1977, Ser. No. 793,398
Int. Cl.[2] B29C *5/00;* **B29D** *3/00, 31/00;* **B29F** *1/10*
U.S. Cl. 264—244 **2 Claims**



1. A method of molding a filler-containing sole for an article of footwear comprising the steps of inserting a filler into a recess in the bottom surface of a dummy last; forming a first mold cavity employing the dummy last, the filler, first portions of opposing mold sides and a bottom mold piston; molding a first sole portion onto the bottom surface of the filler in a first molding operation; opening the mold while leaving the first sole portion and filler on the bottom mold piston; forming a second mold cavity employing an upper or the like on a clamping last, second portions of said mold sides, and the filler and said first sole portion on the bottom mold piston; and molding a second sole portion around the sides of the first sole portion and over the top and side surfaces of the filler in a second molding operation.

4,123,494

METHOD AND APPARATUS FOR REINFORCING A HOT SHAPED SHELL

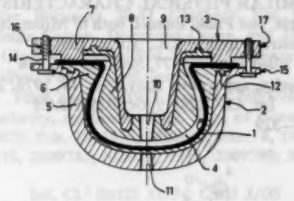
Paul Evrard, Gisors, and Michel-Claude Terroy, Puiseux le Hauberger, both of France, assignors to Altulor, Paris, France

Filed Jul. 6, 1977, Ser. No. 813,348
Int. Cl.[2] B29D *9/00;* **B29F** *1/00*
U.S. Cl. 264—258 **9 Claims**

1. A method for reinforcing a fragile, hot-shaped, hollow shell in a mold, comprising:

placing said fragile shell against an elastically deformable female member shaped to uniformly mate with said shell and uniformly support said shell against molding stresses;

pressing a male mold member within said shell against peripheral portions of said shell thereby forming a mold cavity between said mold member and areas of said shell to be covered with a resin material; securing said male mold member to a rigid female support member; injecting



a molding resin material into said mold cavity and hardening said material; and

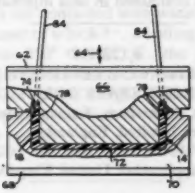
removing said resin coated shell from said mold.

4,123,495

METHOD FOR MAKING MOLDED ARTICLES OF EXPANDED CELLULAR MATERIAL

John A. Abey, Salinas, Calif., assignor to Bud Antle, Inc., Salinas, Calif.

Continuation of Ser. No. 648,244, Jan. 12, 1976, abandoned, which is a division of Ser. No. 510,289, Sep. 30, 1974, abandoned.
This application Nov. 7, 1977, Ser. No. 849,053
Int. Cl.[2] B29F *1/14;* **B29C** *1/14*
U.S. Cl. 264—318 **1 Claim**

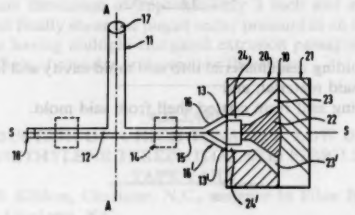


1. A method for molding an elongate surface discontinuity on a wall surface of a part comprising the steps of providing complemental male and female mold sections, supporting said mold sections in confronting juxtaposition at a parting plane to define a cavity having a shape corresponding to the part, forming a recess in the male member bounding the plane and adjacent the surface, the recess having a dimension in the plane greater than the elongate surface discontinuity, providing at least one ejector bar in the surface of the male mold section, said ejector bar having a rear portion remote from the female mold section substantially coextensive with the recess, a surface in coplanar relation to the parting plane when the rear portion resides in the recess, and a front portion extending from the surface which has a surface discontinuity that is the mirror image of the surface discontinuity on the part, filling the cavity with moldable material, curing the moldable material separating the mold sections at the parting plane along a linear path generally parallel to the wall surface and perpendicular to the parting plane, and applying a uniform force to each of a plurality of spaced apart points on the rear portion of the ejector bar to move the ejector bar outward of the male mold section in a direction normal to the parting plane and oblique of the linear path and away from the surface plane discontinuity on the wall surace of the part thereby releasing the part from the male mold section and the ejector bar discontinuity.

4,123,496
PROCESS FOR THE INJECTION MOLDING OF PNEUMATIC TIRES HAVING SYMMETRICAL PARTS OF SIMILAR PHYSICAL CHARACTERISTICS

Achille Gallizia, and Paolo Bandel, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Feb. 7, 1977, Ser. No. 766,038
Claims priority, application Italy, Feb. 19, 1976, 20307 A/76
Int. Cl.[2] B29F *1/04;* B29H *3/08*
U.S. Cl. 264—329 9 Claims

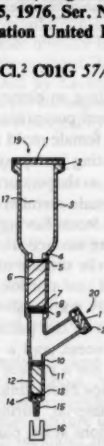


1. A process for the injection molding of pneumatic tires, which comprises forming a primary feed stream of an injectable tire molding compound, obtaining from said primary feed stream a plurality of first intermediate streams predominantly formed from the outer strata of said primary feed stream and another plurality of second intermediate streams predominantly formed from the axial strata of said primary feed stream, combining at least one of said first intermediate streams with at least one of said second intermediate streams to form a combined stream, drawing from said combined stream at least one injection stream, and filling a mold cavity corresponding to each part of each pair of symmetrical parts of the tire with molding compound contained in said injection stream.

4,123,497
PURIFICATION OF TECHNETIUM-99M PERTECHNETATE SOLUTIONS

Clinton F. Ruddock, Amersham, England, assignor to The Radiochemical Centre Limited, England

Filed Feb. 25, 1976, Ser. No. 661,552
Claims priority, application United Kingdom, Mar. 6, 1975, 9479/75
Int. Cl.[2] C01G *57/00*
U.S. Cl. 423—2 9 Claims

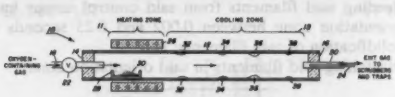


1. A method of preparing a solution of pertechnetate ion in water, which method comprises the steps of:
(1) providing an aqueous electrolyte containing cations and anions and containing technetium-99m in the form of pertechnetate ion TcO_4^-; and
(2) contacting the electrolyte with a cation-exchange material having adsorbed on cation-exchange sites thereof a cation which forms an insoluble salt with said anions in said aqueous solution of the pertechnetate which is otherwise substantially free of cations and anions.

4,123,498
PROCESS FOR SEPARATING FISSION PRODUCT MOLYBDENUM FROM AN IRRADIATED TARGET MATERIAL

Herman S. Rosenbaum, Fremont; Douglas R. Packard, Sunol, and Harry A. Levin, Livermore, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 17, 1977, Ser. No. 769,576
Int. Cl.[2] C01G *39/00*
U.S. Cl. 423—2 12 Claims

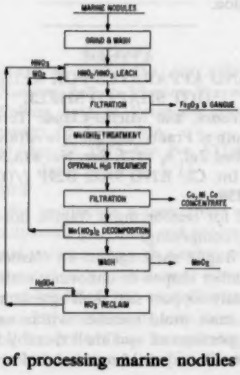


1. A process for the separation and collection of molybdenum-99 from an irradiated enriched uranium-containing target material, the process comprising the steps of
(a) establishing a thermochromatographic zone having a heating zone and a cooling zone cooled by atmospheric cooling,
(b) passing an oxidizing atmosphere successively through said heating and cooling zones,
(c) heating the target material in the heating zone at a temperature less than the melting point of said target material, said temperature being sufficient to drive off fission product gases, oxidize oxide-forming components of the target material and subline sublimable materials including molybdenum-99 trioxide into said oxidizing atmosphere to form a gaseous mixture to be carried into said cooling zone, and
(d) cooling the gaseous mixture in said cooling zone so that the sublimed materials including the molybdenum-99 trioxide are progressively condensed and collected at successive locations in the cooling zone in the form of substantially separate deposits.

4,123,499
RECOVERING METAL VALUES FROM MARINE MANGANESE NODULES

Jay Y. Welsh, Catonsville, and Irving Sochol, Baltimore, both of Md., assignors to Chemetals Corporation, Baltimore, Md.

Filed May 20, 1977, Ser. No. 798,773
Int. Cl.[2] C01G *45/02*
U.S. Cl. 423—35 9 Claims



8. A method of processing marine nodules to selectively

recover manganese values, the nodules comprising primarily oxides of Mn and Fe with lesser proportions of compounds of Cu, Ni, Co, alkali metals and alkaline earth metals, which method comprises the steps of:

(a) washing the nodules with water until substantially all soluble chloride salts have been removed;

(b) leaching the nodules at a temperature below about 80° C. with an aqueous solution of nitrous and nitric acids having a pH of 1.0–2.0 under an equilibrium partial pressure of a combination of nitric oxide and water vapor less than atmospheric pressure, wherein said nodules contain a stoichiometric excess of manganese dioxide equivalent in relation to the nitrous acid content of the aqueous solution, to selectively dissolve Mn, Cu, Ni, and Co while retaining substantially all of the iron oxide in the gangue;

(c) filtering the resulting slurry containing Mn, Cu, Ni, Co, alkali metal and alkaline earth metal nitrates at a pH of less than 2.5 to remove insoluble iron oxide and gangue;

(d) adding $Mn(OH)_2$ to the filtrate in a quantity at least equal to the stoichiometric value of the Cu, Ni and Co metals present in the solution to selectively precipitate said metals as hydroxides;

(e) adding to the filtrate a quantity of H_2S in any proportion up to the $Mn(OH)_2$ equivalent present to precipitate additional metal traces as sulfides;

(f) filtering the solution to remove precipitated metals and separate the manganese nitrate solution.

4,123,500

RECOVERY OF PRECIOUS METALS BY OXIDATION IN THE AQUEOUS PHASE OF ASSOCIATED CARBONACEOUS SUPPORT MATERIAL

Gary J. K. Acres, and Alfred J. Bird, both of London, England, assignors to Johnson, Matthey & Co., Limited, London, England

Continuation of Ser. No. 553,066, Feb. 25, 1975, abandoned. This application Jan. 14, 1977, Ser. No. 759,551

Claims priority, application United Kingdom, Mar. 1, 1974, 9393/74

Int. Cl.² C01G *5/00;* **C22B** *11/04;* **B01J** *23/96, 21/20*

U.S. Cl. 423—35 **2 Claims**

1. A process for the recovery of silver from photographic film comprising subjecting the film in contact with water at a temperature of not less than 200° C. and a pressure not less than 75 atmospheres in an atmosphere comprising a quantity of oxygen at least sufficient to oxidise substantially all the carbon present, the oxidation being carried out in the presence of a liquid aqueous phase, and recovering silver as the oxide from said water.

2. A process according to claim 1, wherein the oxygen present is substantially pure oxygen.

4,123,501

OXIDATION OF METALLIC IRON TO BLACK OXIDE PIGMENTS

Klaus Köhler; Peter Woditsch, and Karl-Heinz Schultz, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 14, 1977, Ser. No. 787,729

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1976, 2617569

Int. Cl.² C01G *49/02*

U.S. Cl. 423—152 **5 Claims**

1. A process for the preparation of a black pigment comprising oxidizing a metallic iron-containing starting material in aqueous suspension with an oxygen-containing gas in the presence of about 5 to 40% of finely divided Fe_3O_4 nuclei of magnetite structure and about 2.5 to 200% of at least one electrolyte, percentages being by weight of metallic iron, at a pH of about 4 to 6.5 and a temperature of about 75° C to 100° C, and separating the resultant Fe_3O_4 pigment from the aqueous medium.

4,123,502

PROCESS FOR THE PURIFICATION OF GAS GENERATED IN THE PRESSURE GASIFICATION OF COAL

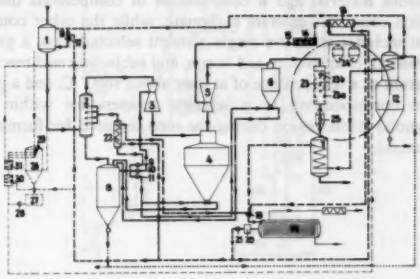
Heinz Hölter, Beisenstr. 39-41, Gladbeck, Fed. Rep. of Germany; Heinz Gresch, Dortmund-Derne, and Heinrich Igelbuscher, Gladbeck, both of Fed. Rep. of Germany, assignors to Heinz Hölter, Fed. Rep. of Germany

Filed Aug. 15, 1975, Ser. No. 605,074

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1975, 2504839; Feb. 28, 1975, 2508666; Mar. 6, 1975, 2509667; Mar. 6, 1975, 2509733; Mar. 6, 1975, 2509789; Mar. 7, 1975, 250994

Int. Cl.² B01D *53/34;* **C10J** *3/00*

U.S. Cl. 423—230 **40 Claims**



1. In a process for purifying gas (generated in pressure gasification of coal, under pressure, at a temperature within the range of from 550° to 1000° C. and containing tar, other heavy hydrocarbons, dust and hydrogen sulfide) which comprises washing the gas with a washing liquid, the improvement wherein the gas is not contacted with water, the washing liquid is a tar oil 95 percent of which has a boiling temperature within the range of from 250° to 360° C., the gas is preliminarily cooled to a temperature within the last-noted range prior to contact with the tar oil and the gas is cooled during the washing only to a temperature which is within the boiling temperature range of the tar oil.

4,123,503

CATALYSIS OF PHOSPHAZENE CYCLICS TO POLYMER, USING LEWIS ACID COMPOUNDS

Dennis L. Snyder, Bolivar; Mark L. Stayer, Jr., Suffield, and Jung W. Kang, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 606,802, Aug. 22, 1975, abandoned. This application Mar. 23, 1977, Ser. No. 771,221

Int. Cl.² C01B *25/10*

U.S. Cl. 423—300 **6 Claims**

1. A process for polymerizing cyclic $(NPCl_2)_n$ in which n is an integer smaller than 7 which comprises heating said polydichlorophosphazene in the presence of an effective amount of a catalyst comprising a Lewis Acid compound selected from the group consisting of (1) organo metallic compounds of a Group IIIA metal represented by the general formula R_aMX_b in which M is a metal of Group IIIA having a valence of $a+b$, X is anionic, R is a monovalent hydrocarbon radical selected from the group consisting of alkyl, aryl, cycloalkyl, alkaryl and arylalkyl, and a is an integer from 1 to 3 and b is an integer from 0 to 3 and (2) boron halides represented by the formula BX_3 wherein X is selected from the group consisting of F, Cl and Br and at temperatures up to about 290° C. to produce a substantially linear $(NPCl_2)_m$ polymer in which m is between about 10 and about 50,000.

4,123,504

METHOD OF MAKING DIAMONDS SYNTHETICALLY

Alexandr A. Shulzhenko, Novo-Konstantinovskaya, 17, kv. 27, and Anatoly F. Getman, Syretskaya, 38, kv. 2, both of Kiev, U.S.S.R.

Continuation of Ser. No. 683,705, May 6, 1976, abandoned, which is a continuation of Ser. No. 582,461, May 28, 1975, abandoned, which is a continuation of Ser. No. 464,431, Apr. 25, 1974, abandoned, which is a division of Ser. No. 292,396, Sep. 26, 1972, Pat. No. 3,906,082, which is a continuation of Ser. No. 68,006, Aug. 28, 1970, abandoned. This application Apr. 4, 1977, Ser. No. 784,593

Int. Cl.[2] C01B *31/06*

U.S. Cl. 423—446 1 Claim

1. A method of making diamonds synthetically, comprising the steps of: preparing a reaction mixture comprising a carbonaceous material and a combination of components one of which comprises calcium carbonate, while the other component includes at least a single element selected from a group consisting of aluminum and boron; and subjecting said reaction mixture to a temperature of at least about 1800° C. and a pressure corresponding to a selected temperature within the diamond stable region during the time required for forming a diamond.

4,123,505

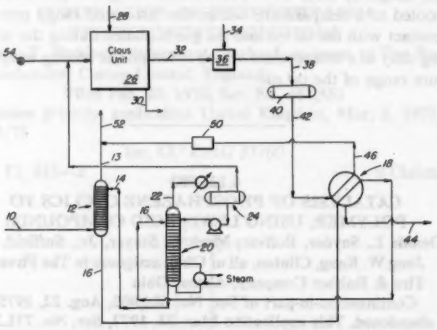
REDUCING SO_2 IN REFINERY OFF GAS

Albert E. Williamson, Bellingham, Wash., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 688,805, May 21, 1976, abandoned. This application Feb. 2, 1978, Ser. No. 874,454

Int. Cl.[2] C01B *17/16, 17/02*

U.S. Cl. 423—564 7 Claims



1. In the process of reducing sulfur moieties from a fuel gas stream containing hydrogen sulfide by scrubbing the fuel gas with an amine solution whereby transferring hydrogen sulfide from said fuel gas to said solution and forming a fuel gas leaner in hydrogen sulfide and an amine solution richer in hydrogen sulfide; springing an intermediate gas comprising hydrogen sulfide from said rich amine solution and simultaneously regenerating said amine scrubbing solution; recirculating said regenerated amine solution to said scrubbing; and converting hydrogen sulfide in said intermediate gas with oxygen, to elemental sulfur and a tail gas comprising sulfur dioxide; the improvement which comprises converting sulfur dioxide in said tail gas to hydrogen sulfide by reducing such with a reducing agent comprising hydrogen; condensing water from said reduction product; and admixing said tail gas derived hydrogen sulfide with said fuel gas leaner in hydrogen sulfide.

4,123,506

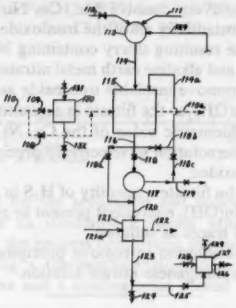
UTILIZATION OF IMPURE STEAM CONTAMINATED WITH HYDROGEN SULFIDE

Jerome S. Spevack, New Rochelle, NY, assignor to Deuterium Corporation, White Plains, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,170

Int. Cl.[2] F22G *1/00*; F03G *7/02*; C01B *17/16, 31/20*

U.S. Cl. 423—566 82 Claims



1. A process controlling emissions of hydrogen sulfide from a system which utilizes a flow of geothermal steam at superatmospheric pressure and produces discharges of liquid water and of noncondensable gases, said steam containing said noncondensable gases together with hydrogen sulfide as impurities therein, which process comprises:

(a) providing a flow of aqueous liquid phase containing reactant dispersed therein, said reactant consisting essentially of at least one metal compound, the metal of which is selected from the class of metals having an electrode oxidation potential positive with respect to hydrogen in the electromotive series, which metal compound has the capability of undergoing reaction with aqueous hydrogen sulfide at the temperature of and in the presence of said flow of geothermal steam to form a solid metal sulfide reaction product suspended in said flow of liquid, said metal sulfide having a solubility product, at 25° C., smaller than 10×10^{-15},

(b) passing said flow of geothermal steam at superatmospheric pressure in contact with said flow of aqueous liquid phase to extract hydrogen sulfide from said flow of geothermal steam by transferring the same into said liquid flow and effecting said reaction with hydrogen sulfide therein,

(c) recovering from said contact the resulting flow of steam at superatmospheric pressure containing noncondensable gases, but depleted in hydrogen sulfide, and the resulting flow of aqueous liquid and metal sulfide reaction product,

(d) delivering said recovered flow of steam at superatmospheric pressure to said system for said utilization as an energy source,

(e) condensing liquid water from said steam in said system,

(f) discharging from said system liquid water condensate substantially free of hydrogen sulfide noncondensable, and

(g) discharging from said system said noncondensable gases substantially free of hydrogen sulfide.

4,123,507

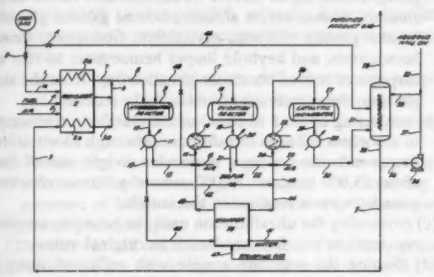
PROCESS FOR REMOVING SULFUR AND NO_x COMPONENTS FROM A GAS STREAM

Robert H. Hass, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 738,134, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 605,638, Aug. 18, 1975. This application Jun. 23, 1977, Ser. No. 809,285

Int. Cl.[2] C01B *17/04;* B01D *53/34*

U.S. Cl. 423—573 G 25 Claims



1. A process for the desulfurization of a feed gas stream containing one or more sulfur components selected from the class consisting of SO_2, COS, CS_2, SO_3, light mercaptans, and sulfur vapor, which process comprises the steps of:

(1) hydrogenating sufficient of the SO_2, SO_3, light mercaptans, and sulfur vapor components and/or hydrolyzing sufficient of the CS_2 and COS components contained in a mixed gas stream comprising said feed gas stream and a vaporized bleed stream recycled from step (7) hereinafter such that, by reaction with sufficient of one or more components selected from the class consisting of H_2, CO plus water vapor, and water vapor, at least about 80% of the non-H_2S sulfur components in the mixed gas stream are converted to H_2S;

(2) contacting at a temperature in excess of 250° F. a mixture of product gas withdrawn from step (1) and a gaseous oxidant comprising oxygen and/or SO_2 with a solid oxidation catalyst so as to oxidize in excess of 50% of the H_2S contained in said product gas to elemental sulfur;

(3) separating free sulfur from the gases produced in step (2), thereby obtaining an off-gas stream containing residual H_2S;

(4) oxidizing with sufficient oxygen at least 90% of the residual H_2S in said off-gas stream to SO_2;

(5) absorbing essentially all of the SO_2 in the SO_2-containing gas obtained in step (4) in an aqueous solution maintained at a pH between about 3.0 and about 6.6, said aqueous solution comprising a component selected from the class consisting of ammonia, soluble amines, ammonium compounds, and combinations thereof;

(6) withdrawing from step (5) a liquid bleed stream containing absorbed SO_2;

(7) vaporizing said bleed stream and recycling vapors so produced to step (1); and

(8) discharging from step (5) a purified product gas stream essentially free of sulfur components including H_2S.

4,123,508

APPARATUS AND METHOD FOR MANUFACTURING DEUTERIUM ENRICHED WATER

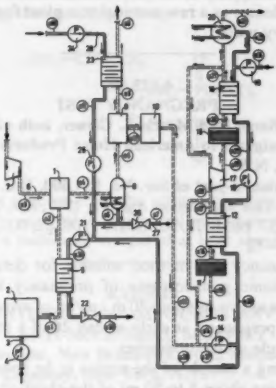
Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 20, 1976, Ser. No. 725,148

Claims priority, application Switzerland, Sep. 22, 1975, 12269/75

Int. Cl.[2] C01B *5/00*

U.S. Cl. 423—580 13 Claims



1. An apparatus for manufacturing deuterium-enriched water comprising

a hydrogen generator for generating hydrogen;

a high pressure steam generator for generating a flow of steam, said steam generator being connected to said hydrogen generator to deliver a flow of steam thereto;

at least one isotope exchange column disposed between said steam generator and said hydrogen generator in the path of the steam flow;

a condensor connected to said hydrogen generator to receive an outflow mixture of hydrogen, steam and nitrogen therefrom for condensing deuterium-enriched water from said mixture; and

at least one exchange stage connected to said condensor downstream of said hydrogen generator relative to a flow of steam and hydrogen from said condensor, said exchange stage including a separating means for a deuterium isotope exchange between hydrogen and steam and an exchange column for an isotope exchange between a flow of steam from said separating means and a flow of water taken from a water source.

9. A method of manufacturing deuterium-enriched water comprising the steps of

passing a flow of heated steam into isotope exchange with a stream of deuterium-enriched water to enrich the steam with deuterium;

thereafter passing the flow of deuterium-enriched steam into a hydrogen generator;

dissociating hydrocarbons in the presence of the steam in the hydrogen generator to produce a flow containing at least deuterium-enriched hydrogen and steam;

thereafter condensing deuterium-enriched water from the flow of deuterium-enriched hydrogen and steam in a condensor downstream of the hydrogen generator while emitting a vaporized mixture of deuterium-enriched hydrogen and steam;

supplying a portion of the deuterium-enriched water in the condensor as a first part of said stream for enriching said flow of heated steam;

feeding the non-condensed mixture in the condensor to at least one exchange stage consisting of a separating means with a catalyst sufficient to perform an enrichment of the steam component of said mixture with deuterium while

depleting deuterium from the hydrogen component of said mixture and subsequently passing said mixture into an exchange column for deuterium exchange in counterflow to a flow of water to enrich said flow of water in deuterium while depleting the deuterium from said steam component;

exhausting the hydrogen from the exchange stage while passing the deuterium-enriched water as a second part of said stream for enriching said flow of heated steam; and

supplying a remainder of the deuterium-enriched water in the condensor as a raw material to a plant for manufacturing heavy water.

4,123,509

PREGNANCY TEST

Upendra K. Banik, and Morris L. Givner, both of Pierrefonds, Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 534,400, Dec. 19, 1974, abandoned. This application Apr. 11, 1977, Ser. No. 786,721

Int. Cl.[2] B01D *13/00;* **G01N** *1/00, 31/00, 33/16*

U.S. Cl. 424—12 **9 Claims**

1. A pregnancy test method suitable for detection of the human chorionic gonadotropin of pregnancy in urine at a concentration as low as about 40 m.i.u./ml of urine and capable of detecting pregnancy as early as day 26 of a regular 28 day menstrual cycle which comprises

(a) clarifying a sample of the urnine to be tested;

(b) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through an ultrafiltration membrane, said membrane having been prewashed with 0.1 to 5% aqueous solution of a protein selected from the group consisting of bovine serum albumin, rabbit serum albumin, human serum albumin, bovine gamma globulin, human gamma globulin, myoglobin, fibrinogen, human hemoglobin, and keyhold limpet hemocyanin so that adsorption of human chorionic gonadotropin from the sample onto the membrane is substantially reduced, and said membrane having a molecular weight cut-off from about 15,000 to about 35,000, whereby human chorionic gonadotropin is retained in the sample;

(c) continuing the ultrafiltration until the retentate sample is one-tenth to one-five hundredth its original volume;

(d) diluting the retentate sample with sufficient water to provide a retentate sample of about 0.5 ml; and

(e) contacting the retentate sample with the appropriate amount of an immunological reagent for detecting the presence of human chorionic gonadotropin in the retentate sample.

6. A pregnancy test method suitable for detection of the human chorionic gonadotropin of pregnancy in urine at a concentration as low as about 40 m.i.u./ml of urine and capable of detecting pregnancy as early as day 26 of a regular 28 day menstrual cycle which comprises:

(a) clarifying a sample of the urine to be tested;

(b) contacting the urine sample before or after clarification with a sufficient amount of a protein selected from the group consisting of bovine serum albumin, rabbit serum albumin, human serum albumin, bovine gamma globulin, human gamma globulin, myoglobin, fibrinogen, human hemoglobin, and keyhold limpet hemocyanin to give a concentration of the protein in the urine of from 0.001 to 1.0% so that absorption of human chorionic gonadotropin from the sample onto the membrane is substantially reduced;

(c) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through an ultrafiltration membrane having a molecular weight cut-off from about 15,000 to about 35,000, whereby human chorionic gonadotropin is retained in the sample;

(d) continuing the ultrafiltration until the retentate sample is one-tenth to one-five hundredth its original volume;

(e) diluting the retentate sample with sufficient water to provide a retentate sample of about 0.5 ml; and

(f) contacting the retentate sample with the appropriate amount of an immunological reagent for detecting the presence of human chorionic gonadotropin in the retentate sample.

9. A pregnancy test method suitable for detection of the human chorionic gonadotropin of pregnancy in urine at a concentration as low as about 40 m.i.u./ml of urine and capable of detecting pregnancy as early as day 26 of a regular 28 day menstrual cycle which comprises:

(a) clarifying a sample of the urine to be tested through a filter, said filter having been pretreated with an 0.1 to 5.0% aqueous solution of a protein selected from the group consisting of bovine serum albumin, rabbit serum albumin, human serum albumin, bovine gamma globulin, human gamma globulin, myoglobin, fibrinogen, human hemoglobin, and keyhold limpet hemocyanin so that absorption of human chorionic gonadotropin from the sample onto the membrane is substantially reduced;

(b) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through an ultrafiltration membrane having a molecular weight cut-off from about 15,000 to about 35,000, whereby human chorionic gonadotropin is retained in the sample;

(c) continuing the ultrafiltration until the retentate sample is one-tenth to one-five hundredth its original volume;

(d) diluting the retentate sample with sufficient water to provide a retentate sample of about 0.5 ml; and

(e) contacting the retentate sample with the appropriate amount of an immumological reagent for detecting the presence of human chorionic gonadotropin in the retentate sample.

4,123,510

METHOD FOR THE DETERMINATION OF GONADOTROPINS

Upendra K. Banik, and Morris L. Givner, both of Pierrefonds, Canada, assignors to American Home Products Corp. (Del.), New York, N.Y.

Continuation-in-part of Ser. No. 786,721, Apr. 11, 1977, which is a continuation-in-part of Ser. No. 534,400, Dec. 19, 1974, abandoned. This application Jun. 14, 1977, Ser. No. 806,569

Int. Cl.[2] B01D *13/00;* **G01N** *1/00, 31/00, 33/16*

U.S. Cl. 424—12 **12 Claims**

1. A method suitable for detection of luteinizing hormone in urine at a concentration as low as about 25 m.I.U./ml of urine and capable of detecting ovulation in a cycling woman, which comprises:

(a) clarifying a sample of the urine to be tested;

(b) contacting the urine sample before, during or after clarification with 0.1 to 5% aqueous solution of a protein selected from the group consisting of bovine serum albumin, rabbit serum albumin, human serum albumin, gamma globulin, myoglobin, fibrinogen, human hemoglobin, and keyhold limpet hemomycin so that adsorption of luteinizing hormone from the sample onto the membrane is substantially reduced;

(c) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through an ultrafiltration membrane having a molecular weight cut-off from about 5,000 to about 50,000, whereby luteinizing hormone is retained in the sample;

(d) continuing the ultrafiltration until the retentate sample is concentrated to one-tenth to one-five hundredth its original volume;

(e) diluting the retentate sample with sufficient water to provide a retentate sample of about 0.5 ml; and

(f) contacting the retentate sample with the appropriate amount of an immunological reagent for detecting the presence of luteinizing hormone in the retentate sample.

3. A method for detecting follicle stimulating hormone or

human menopausal gonadotropin in urine at a concentration of 15 or more m.I.U./ml of urine, which comprises:

(a) clarifying a sample of the urine to be tested;

(b) contacting the urine sample before, during or after clarification with 0.1 to 5% aqueous solution of a protein selected from the group consisting of bovine serum albumin, rabbit serum albumin, human serum albumin, gamma globulin, myoglobin, fibrinogen, human hemoglobin, and keyhold limpet hemomycin so that adsorption of follicle-stimulating hormone or human menopausal gonadotropin from the sample onto the membrane is substantially reduced;

(c) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through an ultrafiltration membrane having a molecular weight cut-off from about 5,000 to about 50,000, whereby follicle-stimulating hormone or human menopausal gonadotropin is retained in the sample;

(d) continuing the ultrafiltration until the retentate sample is one-tenth to one-five hundredth its original volume;

(e) diluting the retentate sample with sufficient water to provide a retentate sample of about 0.5 ml; and

(f) contacting the retentate sample with the appropriate amount of an immunological reagent for detecting the presence of follicle-stimulating hormone or human menopausal gonadotropin.

11. A test method suitable for detection of pituitary gonadotropins in urine at a concentration as low as about 15 m.I.U./ml of urine, which comprises:

(a) clarifying a sample of the urine to be tested through a filter, said filter having been pretreated with an 0.1 to 5.0% aqueous solution of a protein selected from the group consisting of bovine serum albumin, rabbit serum albumin, human serum albumin, gamma globulin, myoglobin, fibrinogen, human hemoglobin, and keyhold limpet hemocyanin so that adsorption of the gonadotropin from the sample onto the membrane is substantially reduced;

(b) subjecting about 5 to 50 ml of the clarified urine sample to absorbent induced ultrafiltration through an ultrafiltration membrane having a molecular weight cut-off from about 5,000 to about 50,000, whereby the gonadotropin is retained in the sample;

(c) continuing the ultrafiltration until the retentate sample is one-tenth to one-five hundredth its original volume;

(d) diluting the retentate sample with sufficient water to provide a retentate sample of about 0.5 ml; and

(e) contacting the retentate sample with the appropriate amount of an immunological reagent for detecting the presence of the gonadotropin in the retentate sample.

4,123,511

THERAPEUTIC COPPER COMPOSITIONS

York Heintze, Bochum, Fed. Rep. of Germany, assignor to Gertrude Fischer, East Liverpool, Ohio

Continuation of Ser. No. 487,713, Jul. 11, 1974, abandoned. This application Jul. 2, 1975, Ser. No. 592,463

Int. Cl.[2] A61K *9/14;* A61L *9/04;* A61K *33/34, 31/695*

U.S. Cl. 424—46 **7 Claims**

1. A non-staining, water-removable sprayable therapeutic copper-containing composition having anti-spasmodic and fungicidal activity for external application to human skin for the treatment of muscle spasms and cramps and athlete's foot fungus which composition consists essentially of a therapeutically potentiating combination of about 2–10% of the composition of a suspension of metallic copper powder or about 0.25–0.75% of the composition of a solution of copper oleate, about 0.4–0.6% of the composition of colloidal silica and about 5% oil of rosemary in isopropyl or ethyl alcohol and methylene chloride, said percentages being by weight.

4,123,512

ANTIBACTERIAL ORAL COMPOSITION

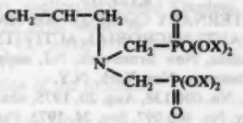
Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 629,749, Nov. 7, 1975, Pat. No. 4,042,679. This application Apr. 25, 1977, Ser. No. 790,782

Int. Cl.[2] A61K *7/16, 7/22*

U.S. Cl. 424—54 **9 Claims**

1. An oral composition comprising an oral vehicle, an amidine antibacterial antiplaque agent tending to stain dental surfaces and a water soluble polymeric polyphosphonic compound having the recurring group:



wherein X is selected from the group consisting of hydrogen and an orally acceptable cation and said compound antistain additive has a molecular weight of at least about 2,000.

4,123,513

QUATERNARY COMPOUNDS HAVING ANTI-MICROBIAL ACTIVITY

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 606,138, Aug. 20, 1975, abandoned, which is a division of Ser. No. 400,097, Sep. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Jun. 2, 1977, Ser. No. 802,761

Int. Cl.[2] A61K *7/22, 31/14;* C07C *87/30*

U.S. Cl. 424—54 **6 Claims**

1. A chemical compound having the structural formula:

$$[RZ(CH_2)_nN^+(CH_3)_2R']X^-$$

wherein R is 1-adamantyl, R' is a long chain alkyl group of 10 to 18 carbon atoms, Z is selected from the group consisting of CH_2 and CHOH, *n* is an integer 1 to 3 and X is an anion.

5. An anti-microbial pharmaceutical composition comprising about 0.1–10% by weight of a chemical compound having the structural formula:

$$[RZ(CH_2)_nN^+(CH_3)_2R']X^-$$

wherein R is 1-adamantyl, R' is a long chain alkyl group of 10 to 18 carbon atoms, Z is selected from the group consisting of CH_2 and CHOH, *n* is an integer 1 to 3 and X is an anion, admixed with a pharmaceutical vehicle, wherein said pharmaceutical vehicle comprises an inert carrier and a surface active agent in which said compound is dissolved or a solid inert carrier.

4,123,514

QUATERNARY COMPOUNDS HAVING ANTI-MICROBIAL ACTIVITY

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 606,138, Aug. 20, 1975, abandoned, which is a division of Ser. No. 400,097, Sep. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Jun. 2, 1977, Ser. No. 802,763

Int. Cl.[2] A61K *7/22, 31/27;* C07C *69/00*

U.S. Cl. 424—54 **4 Claims**

1. A chemical compound having the structural formula:

$$[RNHCOO(CH_2)_nN^+(CH_3)_2R']X^-$$

wherein R is 1-adamantyl, R' is a long chain alkyl group of 10 to 18 carbon atoms, *n* is an integer 1 to 3 and X is an anion.

3. An anti-microbial pharmaceutical composition compris-

ing about 0.1–10% by weight of a chemical compound having the structural formula:

$$[RNHCOO(CH_2)_nN^+(CH_3)_2R']X^-$$

wherein R is 1-adamantyl, R' is a long chain alkyl group of 10 to 18 carbon atoms, *n* is an integer 1 to 3 and X is an anion, admixed with a pharmaceutical vehicle, wherein said pharmaceutical vehicle comprises an inert carrier and a surface active agent in which said compound is dissolved or a solid inert carrier.

4,123,515

QUATERNARY COMPOUNDS HAVING ANTI-MICROBIAL ACTIVITY

Robert A. Bauman, New Brunswick, NJ, assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 606,138, Aug. 20, 1975, abandoned, which is a division of Ser. No. 400,097, Sep. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Jun. 2, 1977, Ser. No. 802,764

Int. Cl.[2] A61K *7/22, 31/27*

U.S. Cl. 424—54 **5 Claims**

1. An anti-microbial pharmaceutical composition comprising about 0.1–10% by weight of a chemical compound having the structural formula:

$$[RNHCSO(CH_2)_nN(CH_3)_2R^1 +]X^-$$

wherein R is 1-adamantyl, R^1 is a long chain alkyl group of 10 to 18 carbon atoms, *n* is an integer from 1 to 3, and X is a compatible anion admixed with a pharmaceutical carrier.

4,123,516

QUATERNARY COMPOUNDS HAVING ANTI-MICROBIAL ACTIVITY

Robert A. Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 606,138, Aug. 20, 1975, abandoned, which is a division of Ser. No. 400,097, Sep. 24, 1973, Pat. No. 3,928,411, which is a continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Jun. 2, 1977, Ser. No. 802,760

Int. Cl.[2] A61K *7/22, 31/215*

U.S. Cl. 424—54 **6 Claims**

1. anti anti-microbial pharmaceutical composition comprising about 0.1–10% by weight of a chemical compound having the structural formula

$$[RCOO(CH_2)_nN(CH_3)_2R^{1+}]X^-$$

wherein R is 1-adamantyl, R^1 is a long chain alkyl group of 10 to 18 carbon atoms, *n* is an integer from 1 to 3 and X is a compatible anion, admixed with a pharmaceutical vehicle, wherein said pharmaceutical vehicle comprises an inert carrier and a surface active agent in which said compound is dissolved or a solid inert carrier.

4,123,517

TOOTHPASTE COMPOSITIONS

Eric Baines, Flixton, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

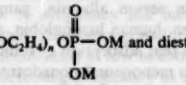
Filed Dec. 31, 1975, Ser. No. 645,743

Claims priority, application United Kingdom, Jan. 15, 1975, 1798/75

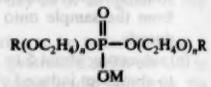
Int. Cl.[2] A61K *7/16, 7/18*

U.S. Cl. 424—57 **7 Claims**

1. A toothpaste comprising a dentally acceptable oral vehicle and dispersed therein about 20–75% by weight of a polishing material including ground alpha-alumina trihydrate having an average particle diameter in a range of about 2 to 20 microns wherein the pH of a 10–20% by weight of a slurry of the alpha alumina trihydrate prior to grinding is in the range of about 7.5–9.5 and the pH of such a slurry after said grinding is higher than before grinding and is above 8, said alpha alumina trihydrate being present in amount of at least 10% by weight of the toothpaste, and about 0.5–3% by weight of an anionic phosphate ester surface active agent comprising a mixture of mono ester of the formula



and diester of the formula



wherein R is an alkyl group of 10 – 20 carbon atoms, *n* is an integer from 1 – 6 and M is selected from the group consisting of hydrogen, alkali metal and ammonium, said toothpaste having a pH toothpaste of about 5 – 9, said anionic phosphate ester surface active agent being effective to provide consistency and body to said toothpaste and render said toothpaste compatible with an unlined aluminum container.

4,123,518

INSECTICIDAL PHOSPHATE ESTER-BASED SOLID COMPOSITION WITH DEPOT GAS ACTION

Wolfgang Behrenz, Overath-Steinenbrueck, and Klaus Burkhardt, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 624,215, Oct. 20, 1975, abandoned. This application Feb. 28, 1977, Ser. No. 772,390

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1974, 2450677

Int. Cl.[2] A01N *17/00*

U.S. Cl. 424—78 **5 Claims**

1. An insecticidal preparation having a depot gas action and comprising an insecticidally effective amount of dimethyl-2,2-dichlorovinyl thiophosphate in admixture with an unsaturated polyester copolymer resin as carrier, the resin being a condensation product of maleic anhydride, phthalic anhydride, propanediol, dipropylene glycol and styrene, whereby the preparation exhibits extended insecticidal activity.

4,123,519

INJECTABLE CONTRACEPTIVE VACCINE AND METHOD

Ronald L. Tribble, Savannah, and Charles M. Stagg, St. Joseph, both of Mo., assignors to Philips Roxane, Inc., St. Joseph, Mo.

Continuation of Ser. No. 715,163, Aug. 17, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,506

Int. Cl.[2] A61K *39/00*

U.S. Cl. 424—88 **4 Claims**

1. A method of inducing a contraceptive effect in a female canine having had at least one previous estrous cycle, which method comprises parenterally administering to said female canine during the period subsequent to estrous, in an amount sufficient to bind at least 70 pg of estradiol-17 beta per ml of serum, an injectable composition capable of preventing conception in a female canine, said injectable composition being produced by a process which comprises the steps of: esterifying the hydroxyl groups of estradiol-17 beta with succinic anhydride to form the estradiol-17 beta hemisuccinate and coupling said hemisuccinate to the amino group of a protein selected from the group consisting of keyhole limpet hemocyanin, bovine serum albumin and human serum albumin, about 5 to about 40 molecules of estradiol-17 beta being bound to each molecule of the protein, to obtain an antigen and emulsifying said antigen in an adjuvant in the order of 1 mg of antigen per 2 mls of adjuvant therefor.

4,123,520

METHOD FOR PREPARING HIGH MOLECULAR WEIGHT MENINGOCOCCAL GROUP C VACCINE

Arpi Hagopian, Clark; Dennis J. Carlo, South Amboy, and Thomas H. Stoudt, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 1, 1977, Ser. No. 820,665
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 5 Claims

1. A process for the preparation of antigenic meningococcal polysaccharide active against Group C meningococci wherein at least 80% of the polysaccharide has a molecular weight in excess of 100,000,000 daltons comprising:

a. growing a culture of Group C meningococci in a suitable culture media;
b. isolating the polysaccharide from culture by precipitation with a quaternary ammonium halide salt;
c. dissolving the precipitate in aqueous calcium chloride solution;
d. precipitating the polysaccharide by bringing the aqueous polysaccharide solution to 75%–85% v/v in ethanol;
e. dissolving the precipitate in buffer at a pH of 6.8 to 7.2, and extracting with aqueous phenol solution;
f. precipitating the polysaccharide by bringing the phenol extracted solution to a concentration of 40%–50% v/v in ethanol; and
g. collecting the precipitate.

2. A method of purifying a polysaccharide of Group C meningococci comprising dissolving a precipitate of the polysaccharide in an aqueous buffer at pH 6.8 to 7.2; extracting the solution comprising the polysaccharide a plurality of times with an aqueous phenol solution; bringing the polysaccharide solution to a concentration of 30%–33% v/v in ethanol and ultracentrifuged; then bringing the supernatant fluid to a concentration of 40%–50% v/v in ethanol to precipitate the polysaccharide, and collecting the polysaccharide.

4,123,521

ANTIBIOTIC U-53,946 AND PROCESS FOR PREPARING THE SAME

Ladislav J. Hanka, and Paul F. Wiley, both of Kalamazoo, MI, assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 22, 1977, Ser. No. 789,644
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—121 5 Claims

1. Antibiotic U-53,946, which is active against Gram-positive bacteria, and which in its essentially pure form:

(a) has the molecular formula $C_{61}H_{107}N_{11}O_{14}$;
(b) has the following elemental analysis: C, 60.13, 59.73; H, 9.21, 8.92; N, 12.16, 11.97; O, 18.44;
(c) has a specific rotation of $[\alpha]_D^{25} = -26°$ (c, 0.9175 EtOH);
(d) is soluble in lower alcohols, for example, methanol, ethanol and butanol; ketones, for example, methyl ethyl ketone, halogenated solvents, ethyl acetate, or other ester-type solvents; and is relatively insoluble in aliphatic hydrocarbons;
(e) has a characteristic infrared adsorption spectrum when dissolved in a mineral oil mull as shown in FIG. 1 of the drawings; and,
(f) has a characteristic UV spectrum as shown in FIG. 2 of the drawings.

4,123,522

CONTROL OF BLOAT IN RUMINANTS

Jeremiah J. O'Connor, Flemington; Raymond R. Pilote, Somerset, both of N.J., and Wayne H. Linkenheimer, Washington Crossing, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jun. 15, 1977, Ser. No. 806,793
Int. Cl.[2] A61K *35/70*
U.S. Cl. 424—116 12 Claims

1. The method of treating bloat in ruminants comprising administering an effective amount of the antibiotic S 15–1 to the bloated ruminant.

4,123,523

ANALGESIC AND SEDATIVE POLYPEPTIDES

Anand S. Dutta; James J. Gormley; Christopher F. Hayward; John S. Morley; Nigel N. Petter, and Gilbert J. Stacey, all of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jun. 3, 1977, Ser. No. 803,233
Claims priority, application United Kingdom, Jun. 21, 1976, 25643/76; Oct. 28, 1976, 44840/76
Int. Cl.[2] A61K *37/02*; C07C *103/52*
U.S. Cl. 424—177 10 Claims

1. A polypeptide of the formula:-

H-Tyr-A-Gly-Phe-B-P-E I

in which A is selected from the group consisting of D-Ala, D-Ser, D-Met and Gly; B is selected from the group consisting of Leu and Met, E is selected from the group consisting of a hydroxy and amino radical and an alkoxy radical of 1 to 6 carbons; and P is a peptide residue selected from those of the formula:-

Lys-Lys II

Asn-Ala-Y-Lys-Lys III

Ala-Ile-X-Lys-Asn-Ala-Y-Lys-Lys IV

Thr-Leu-Phe-Lys-Asn-Ala-Ile-X-Lys-Asn-Ala-Y-Lys-Lys V

and

Ser-Gln-Thr-Pro-Leu-Val-Thr-Leu-Phe-Lys-Asn
Ala-Ile-X-Lys-Asn-Ala-Y-Lys-Lys VI

in which X is Val or Ile and Y is Tyr or His; and the pharmaceutically-acceptable acid-addition salts thereof, and where the polypeptide of the formula I contains a free carboxygroup, the pharmaceutically-acceptable base-addition salts thereof.

9. A method of producing analgesia in warm-blooded animals including man which comprises administering an analgesically-effective amount of a polypeptide as claimed in claim 1.

4,123,524

SYNTHESIS OF 6-AMINO-4-METHYL-8-(β-D-RIBOFURANOSYL)PYRROLO[4,3,2-DE]PYRIMIDO[4,5-C]PYRIDAZINE-5'-PHOSPHATE AS A NOVEL COMPOUND AND ITS UTILITY AGAINST L-1210 MOUSE LEUKEMIA

Leroy B. Townsend; Arthur F. Lewis, and Linda W. Roti Roti, all of Salt Lake City, Utah, assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Jun. 8, 1977, Ser. No. 804,601
Int. Cl.[2] A61K *31/70*; C07H *19/02*
U.S. Cl. 424—180 2 Claims

2. The method of alleviating and treating L-1210 mouse leukemia which comprises injecting intraperitoneally over a 9-day administration span daily an anti-leukemic dosage of the compound 6-amino-4-methyl-8-(β-D-ribofuranosyl)pyrrolo[4,3,2-de]pyrimido[4,5-c]pyridazine-5'-phosphate in a dose range of 8–62 mg/kg.

4,123,525

SUBLIMABLE INSECTICIDAL COMPOSITIONS CONTAINING TRIISOPROPYL- OR TRITERTIARY-BUTYL-S-TRIOXANE CARRIERS

Yasuhiko Ueno, Kawanishi; Yoshito Saeki, Suita; Takuya Akiyama, Nagaokakyo, and Masao Fujita, Amagasaki, all of Japan, assignors to Ogawa & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 463,176, Apr. 22, 1974, abandoned. This application Oct. 29, 1976, Ser. No. 737,196
Claims priority, application Japan, Jun. 15, 1973, 48/68013; Jun. 15, 1973, 48/68014
Int. Cl.[2] A01N *9/36, 9/28, 9/20*
U.S. Cl. 424—200 20 Claims

1. In a sublimable insecticidal composition in the form of rough grains, pulverized powders or tablets consisting essentially of an effective amount of at least one phosphate or carbamate insecticide and a carrier therefor, said insecticide being intimately mixed with the carrier, the improvement wherein the carrier is triisopropyl-s-trioxane having a melting point of 62.5° C. or tritertiarybutyl-s-trioxane having a melting point of 92.0° C.

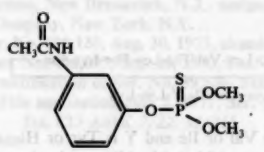
4,123,526

THIONOPHOSPHATE INSECTICIDE ACTIVATORS

George B. Large, Orinda, Calif., and Leland S. Pitt, Greenville, Miss., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 24, 1975, Ser. No. 643,969
Int. Cl.[2] A01N *9/36*
U.S. Cl. 424—200 22 Claims

1. A method of controlling insects comprising applying to the habitat thereof an insecticidally effective amount of a composition of matter comprising N-(mercaptomethyl)phthalimide S-(O,O-dimethylphosphorodithioate) and an effective amount of an activator having the formula



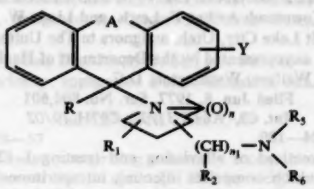
4,123,527

N-TRICYCLIC DERIVATIVES OF AZETIDINE AND PROCESS FOR THEIR PREPARATION

Piero Melloni, Bresso, Milan; Arturo Della Torre, Gallarate, Varese; Francesco Lauria, Milan; Norina Passerini, Milan; Alessandro Rossi, Milan, and Raffaele Tommasini, Milan, all of Italy, assignors to Carlo Erba, S.p.A., Milan, Italy

Filed Jan. 9, 1976, Ser. No. 647,980
Claims priority, application Italy, Jan. 24, 1975, 19535 A/75
Int. Cl.[2] C07D *205/04;* A61K *31/395*
U.S. Cl. 424—244 58 Claims

1. A compound of the formula:



wherein

A is a C_1–C_3 alkylene, a C_1–C_3 alkylene substituted by at least one C_1–C_4 alkyl; a C_2–C_3 alkenylene; a cyclopropylene;

R, R_1 and R_2, each independently represent a hydrogen atom or a C_1–C_6 alkyl;

Y is a hydrogen atom; a C_1–C_6 alkyl; a halogen atom; a trifluoromethyl; an $—OR_3$, wherein R_3 is hydrogen or C_1–C_6 alkyl; or a $—SO_2R_4$, wherein R_4 is C_1–C_6 alkyl, an amino or an amino substituted by 1–2 C_1–C_6 alkyls;

n is zero or 1;

n_1 is zero, 1 or 2;

R_5 and R_6 each independently represent,

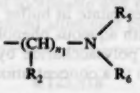
(a) hydrogen;

(b) formyl;

(c) a C_1–C_6 alkyl, a C_2–C_6 alkenyl or C_2–C_6 alkynyl group,

(d) a C_2–C_6 alkanoyl group, wherein the alkyl chain can be substituted by at least one substituent selected from the group consisting of halogen, C_1–C_6 alkoxy, amino, an amino substituted by 1–2 C_1–C_6 alkyl groups, phenyl, phenyl substituted by at least one Y radical, wherein Y is as defined above,

provided that when n_1 is zero, the



radical is exclusively bound to the carbon atom in the 3-position of the azetidine radical;

and the pharmaceutically acceptable acid addition salts thereof.

2. 1-[5-(10,11-dihydro-5H-dibenzo[a,d]cycloheptenyl)]-3-methylamino-azetidine as claimed in claim 1.

5. 1-[5-(10,11-dihydro-5H-dibenzo[a,d]cycloheptenyl)]-3-ethylamino-azetidine, as claimed in claim 1.

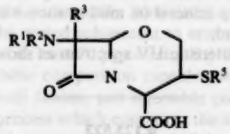
4,123,528

3-(SUBSTITUTED THIO) CEPHALOSPORINS, DERIVATIVES AND NUCLEAR ANALOGUES THEREOF

Lovji D. Cama, Edison, and Burton G. Christensen, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 634,081, Nov. 21, 1975, abandoned. This application Jul. 27, 1977, Ser. No. 819,652
Int. Cl.[2] C07D *498/04;* A61K *31/535*
U.S. Cl. 424—248.52 3 Claims

1. A compound having the structural formula:



and the non-toxic, pharmaceutically acceptable salts thereof; wherein:

the dotted line indicates provision for both Δ^2 and Δ^3 embodiments;

R^1 and R^2 are independently selected from the group consisting of hydrogen and acyl;

R^3 is hydrogen, methoxy, and lower alkyl thio; and

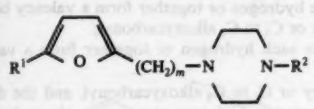
R^5 is amino loweralkyl.

4,123,529
PHENYLPIPERAZINE DERIVATIVES

John P. Verge, Middle Assendon, and William B. Jamieson, Kettlewell Close, both of England, assignors to Lilly Industries Limited, London, England

Continuation-in-part of Ser. No. 781,602, Mar. 28, 1977, abandoned. This application Jul. 8, 1977, Ser. No. 813,912
Claims priority, application United Kingdom, Apr. 23, 1976, 16256/76
Int. Cl.[2] A61K *31/495;* C07D *413/06, 417/06, 407/06*
U.S. Cl. 424—250 18 Claims

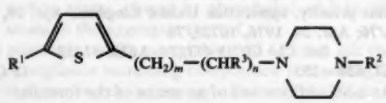
1. A phenylpiperazine derivative which is a furan of formula (II):



(II)

where R^1 is phenyl or phenyl substituted by one or two radicals selected from halogen, C_{1-4} alkyl, C_{1-4} alkoxy and C_{1-4} haloalkyl; R^2 is phenyl or phenyl substituted by C_{1-4} alkyl, amino, C_{1-4} alkylsulphonamido and C_{1-4} alkoxy and m is 1 or 3, with the exception of compounds in which R^1 is unsubstituted phenyl, m is 1 and R^2 is unsubstituted phenyl; or where R^1 is methyl, m is 1 and R^2 is phenyl or phenyl substituted by a single radical selected from halogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl or is disubstituted by two C_{1-4} alkyl radicals; or a pharmaceutically-acceptable salt thereof.

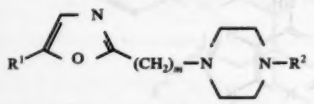
2. A phenylpiperazine which is a thiophene of formula (III):



(III)

where R^1 is phenyl; R^2 is phenyl, phenyl singly substituted by C_{1-4} alkyl or C_{1-4} haloalkyl or doubly substituted by two radicals selected from the group comprising halogen, C_{1-4} haloalkyl and C_{1-4} alkyl, and where m is 1 or 2 and $n = 0$; or where m is 1, n is 1 and R^3 is ethyl; or a pharmaceutically-acceptable salt thereof.

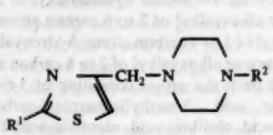
3. A phenylpiperazine which is an oxazole of formula (IV):



(IV)

where R^1 is phenyl optionally substituted by C_{1-4} alkoxy or halogen; R^2 is phenyl optionally substituted by C_{1-4} alkyl, C_{1-4} haloalkyl, halogen, amino or C_{2-4} alkanoylamino and m is 1 or 2; or a pharmaceutically-acceptable salt thereof.

4. A phenylpiperazine of formula (I) according to claim 1, which is a thiazole of formula:



where R^1 is benzyl, R^2 is phenyl or p-halophenyl; or a pharmaceutically-acceptable salt thereof.

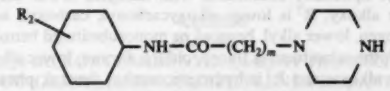
18. A method of treating a mammal, including a human, suffering from, or susceptible to, an immediate hypersensitivity condition such as asthma which comprises administering to the mammal a chemotherapeutically effective amount of a compound of formula (I) as claimed in claim 4.

4,123,530
N-CYCLOHEXYL-PIPERAZINO ACETAMIDES AND PROPIONAMIDES

Camillo Corvi-Mora, Milan, Italy, assignor to Camillo Corvi S.p.A., Piacenza, Italy

Filed Jan. 12, 1977, Ser. No. 758,725
Claims priority, application Italy, Jan. 23, 1976, 19517 A/76
Int. Cl.[2] H61K *31/495;* C07D *295/14*
U.S. Cl. 424—250 6 Claims

1. A compound of the formula



wherein R_2 is hydrogen or a lower alkyl group of from 1 to 6 carbon atoms and m is 1 or 2.

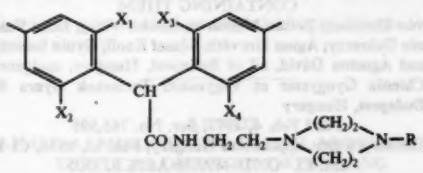
4. A pharmaceutical composition having antisecretory and antiulcer activity comprising a compound according to claim 1 together with a pharmaceutically compatible carrier.

4,123,531
ANTI-CONVULSANT N-ETHANOLAMINE DIPHENYL ACETAMIDES

Michel Vincent, Bagneux; Georges Remond, Versailles; Michel Laubie, Vaucresson, and Jean-Claude Poignant, Bures, Yvette, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

Filed Nov. 26, 1976, Ser. No. 745,032
Claims priority, application France, Dec. 3, 1975, 75 36918
Int. Cl.[2] A61K *31/165, 31/495;* C07D *295/08, 295/10*
U.S. Cl. 424—250 11 Claims

1. A compound having the formula



in which

X_1, X_2, X_3, and X_4 are the same or different and are selected from the group consisting of a lower alkyl radical having from 1 to 6 carbon atoms

R is hydrogen, an alkyl radical having from 1 to 6 carbon atoms, a hydroxylower alkyl radical of 1 to 6 carbon atoms, a acyloxylower alkyl radical of 1 to 6 carbon atoms or a lower alkoxy lower alkyl radical of 1 to 6 carbon atoms.

10. A method for treating epilepsy in the man or in the animals suffering from said illness which consists in administering to the patients a small but effective amount of a compound of claim 1.

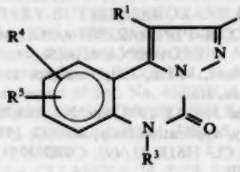
4,123,532
METHOD FOR TREATMENT OF ASTHMA

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 28, 1977, Ser. No. 781,618
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 7 Claims

1. A method of preventing the symptoms of asthma in a mammalian host in need of such treatment, which comprises

administering to a mammalian host a prophylactically effective amount of a compound of the structure



wherein R^1 is hydrogen, lower alkoxycarbonyl, lower alkyl, phenyl optionally substituted with halogen, lower alkyl or lower alkoxy, R^2 is lower alkoxycarbonyl, carboxyl, acetyl, hydrogen, lower alkyl, benzoyl or monosubstituted benzoyl in which the substituent is fluoro, chloro, bromo, lower alkyl, or lower alkoxy; and R^3 is hydrogen, methyl, benzyl, phenyl or monosubstituted phenyl or monosubstituted benzyl in which the substituent is fluoro, chloro or bromo; R^4 and R^5 may be the same or different and may be hydrogen, lower alkyl, lower alkoxy, F, Cl or Br or pharmaceutically acceptable salts thereof, dispersed in a non-toxic physiologically acceptable carrier.

4,123,533

FUSED PYRIMIDINE DERIVATIVES AND COMPOSITIONS FOR TREATING ATHEROSCLEROSIS CONTAINING THEM

István Hermecz; Zoltán Mészáros; Sándor Virag; Lelle Vasvári née Debreczy; Ágnes Horváth; József Knoll; Gyula Sebestyén, and Ágoston Dávid, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

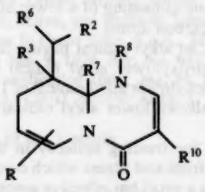
Filed Feb. 4, 1977, Ser. No. 765,595

Claims priority, application Hungary, Feb. 12, 1976, CI 1642

Int. Cl.[2] C07D *487/04;* A61K *31/505*

U.S. Cl. 424—251 **27 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or C_1 to C_6 alkyl;

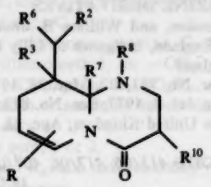
R^2 and R^3 are each hydrogen or together form a valency bond;

R^6 is carboxy or C_1 to C_6 alkoxycarbonyl;

R^7 and R^8 are each hydrogen or together form a valency bond;

R^{10} is carboxy or C_1 to C_6 alkoxycarbonyl and the dotted line represents two hydrogen atoms or a valency bond.

27. A pharmaceutical composition for treating atherosclerosis consisting essentially of a compound of the formula:



or a pharmaceutically acceptable salt thereof, wherein R is hydrogen or C_1 to C_6 alkyl;

R^2 and R^3 are hydrogen or together form a valency bond;

R^6 is carboxy or C_1 to C_6 alkoxycarbonyl;

R^7 and R^8 are each hydrogen or together form a valency bond;

R^{10} is carboxy or C_1 to C_6 alkoxycarbonyl; and the dotted line represents two hydrogen atoms or a valency bond, in combination with a pharmaceutically acceptable carrier.

4,123,534

ADENINE DERIVATIVES AND HYPOLIPIDEMIC COMPOSITION THEREOF

Karl Credner, Kaarst; Günter Brenner, Grefrath; Manfred Tauscher, Gronau, Leine, and Ljerka Jozic, Hannover, all of Fed. Rep. of Germany, assignors to Johann W. Wulfing, Fed. Rep. of Germany

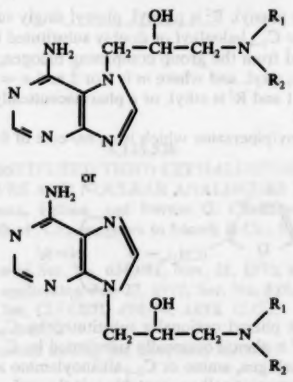
Filed Apr. 22, 1977, Ser. No. 789,845

Claims priority, application United Kingdom, Apr. 24, 1976, 16720/76; Apr. 24, 1976, 16721/76

Int. Cl.[2] C07D *473/34;* A61K *31/52*

U.S. Cl. 424—253 **13 Claims**

1. An acid addition salt of an amine of the formula:



wherein

R_1 is alkyl of 1 to 4 carbon atoms, hydroxyalkyl of 2 to 4 carbon atoms or alkoxyalkyl of 2 to 6 carbon atoms; and

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms; hydroxyalkyl of 2 to 4 carbon atoms or alkoxyalkyl of 2 to 6 carbon atoms;

and an acid selected from the group consisting of 3-methylpyrazole-5-carboxylic acid, 3-methylisoxazole-5-carboxylic acid, acetylsalicylic acid, clofibric acid, nicotinic acid, fusaric acid, theophyllinyl-7-acetic acid, orotic acid, 5-chloroindole-2-carboxylic acid, 5-methylisoxozole-3-carboxylic acid, 3,4,5,-trimethoxybenzoic acid and flufenamic acid.

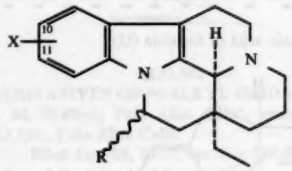
12. The method of reducing hyperlipidemia in an animal which comprises administering thereto a hypolipidemically effective amount of a salt according to claim 1.

4,123,535
PSYCHOSTIMULATING 14-AMINO-14,15-DIHYDROEBURNAMENINES

Paul Pfaffli, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 609,357, Sep. 2, 1975, Pat. No. 4,045,443.
This application Apr. 18, 1977, Ser. No. 788,510
Claims priority, application Switzerland, Sep. 6, 1974, 12153/74; Jun. 3, 1975, 7118/75
Int. Cl.[2] C07D *519/04;* A61K *31/445*
U.S. Cl. 424—256 11 Claims

1. A compound of formula I,



I

wherein

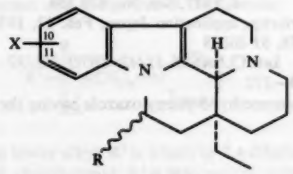
X is hydrogen or halogen having an atomic number from 9 to 35 in the 10- or 11-position, and

R is NR_3R_4, and

R_3 and R_4 are, independently, hydrogen, alkyl or 1 to 4 carbon atoms, phenyl or phenylalkyl of 7 to 10 carbon atoms in the aggregate thereof,

or a pharmaceutically acceptable acid addition salt thereof.

9. A vigilance increasing composition comprising an effective vigilance increasing amount of a compound of the formula



wherein

X is hydrogen or halogen having an atomic number from 9 to 35 in the 10- or 11-position, and

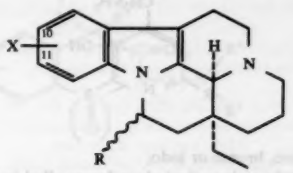
R is SR_2 or NR_3R_4,

wherein R_2 is alkyl of 1 to 4 carbon atoms, hydroxyalkyl or aminoalkyl of 2 to 4 carbon atoms, wherein the hydroxy and amino groups are in other than the α-position to the O or S atom, phenyl or phenylalkyl of 7 to 10 carbon atoms in the aggregate thereof, and

R_3 and R_4 are, independently, hydrogen, alkyl or 1 to 4 carbon atoms, phenyl or phenylalkyl of 7 to 10 carbon atoms in the aggregate thereof,

or a pharmaceutically acceptable acid addition salt thereof in association with a pharmaceutical carrier or diluent.

11. A method of psychostimulation in animals, which comprises administering to an animal in need of such treatment an effective psychostimulating amount of a compound of the formula



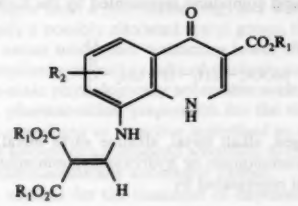
where X and R are as defined in claim 9.

4,123,536
DIALKYL ({[3-(ALKOXYCARBONYL)-1,4-DIHYDRO-4-OXO-8-QUINOLINYL]AMINO}METHYLENE)PROPANEDIOATES

David T. Connor, Ann Arbor, Mich.; Patricia A. Young, Madison, N.J., and Maximilian Von Strandtmann, New Castle, Del., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 14, 1977, Ser. No. 860,526
Int. Cl.[2] A61K *31/47;* C07D *215/56*
U.S. Cl. 424—258 7 Claims

1. A compound having the formula IV:



IV

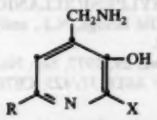
wherein R_1 is lower alkyl; and R_2 is hydrogen, halogen, lower alkyl or nitro.

4,123,537
2-HALO-4-AMINOMETHYL-6-ALKYL-3-PYRIDINOLS USEFUL AS DIURETICS IN TREATING HYPERTENSION AND EDEMA

Robert L. Smith, Lansdale; Gerald E. Stokker, Gwynedd Valley, and Edward J. Gragoe, Jr., Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 26, 1977, Ser. No. 800,973
Int. Cl.[2] A61K *31/345;* C07D *213/65*
U.S. Cl. 424—263 11 Claims

1. A compound of the formula:



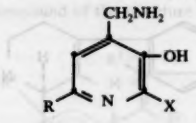
wherein

X is chloro, bromo or iodo;

R is straight or branched chain lower alkyl having up to 5 carbon atoms

and the non-toxic pharmaceutically acceptable acid addition salts thereof.

8. A pharmaceutical composition useful for the treatment of edema and hypertension which comprises a compound of the formula:



wherein

X is chloro, bromo or iodo;

R is straight or branched chain lower alkyl having up to 5 carbon atoms; or

the non-toxic pharmaceutically acceptable salts thereof and a pharmaceutically acceptable carrier.

4,123,538

(2-AMINO-2-OXOETHOXY)ACETIC ACID COMPOUNDS, COMPOSITIONS AND METHODS

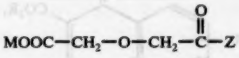
Michael J. Umen, Glenside, PA, assignor to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Filed Aug. 30, 1977, Ser. No. 829,117

Int. Cl.[2] C07D *211/16;* A61K *31/445*

U.S. Cl. 424—267 **4 Claims**

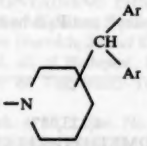
1. A pharmaceutical composition suitable for inhibiting gastric secretion in dosage unit form comprising per dosage unit from about 10 to about 500 milligrams of a (2-amino-2-oxoethoxy)acetic acid compound represented by the formula



wherein

M is hydrogen, alkali metal, alkaline earth metal, ammonium, alkylammonium or hydroxyalkylammonium; and

Z is a radical represented by



wherein

Ar is phenyl, trifluoromethylphenyl, halo-substituted-phenyl, lower alkyl-substituted-phenyl, or lower alkoxy-substituted-phenyl.

4,123,539

6-ETHYLPENICILLANIC ACID

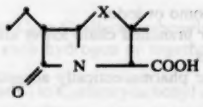
Frank P. DiNinno, Old Bridge, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 29, 1977, Ser. No. 865,639

Int. Cl.[2] A61K *31/425;* C07D *513/04*

U.S. Cl. 424—270 **3 Claims**

1. A compound having the structure:



wherein: X is S or SO; and the pharmaceutically acceptable salts thereof.

4,123,540

ISOCLAVULANIC ACID AS AN ANTIBACTERIAL AND A β-LACTAMASE INHIBITOR

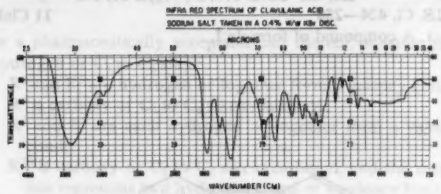
Thomas T. Howarth, Elmhurst, England, assignor to Beecham Group Limited, Great Britain

Filed Dec. 8, 1975, Ser. No. 638,373

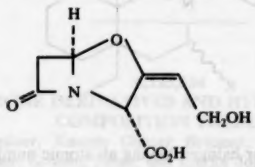
Claims priority, application United Kingdom, Dec. 18, 1974, 54788/74; Apr. 14, 1975, 15210/75

Int. Cl.[2] C07D *498/04;* A61K *31/42*

U.S. Cl. 424—272 **18 Claims**



1. Isoclavulanic acid of formula (II):



(II)

or a pharmaceutically acceptable salt thereof.

4,123,541

2-AMINOMETHYL-5-PHENYLOXAZOLES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Sho Inoue; Katsuya Ohata, both of Kyoto; Satoshi Tsutsui, Yokohama, and Tatsuo Nomura, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo and Nippon Shinyaku Company, Limited, Kyoto, both of, Japan

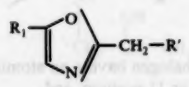
Division of Ser. No. 766,975, Feb. 9, 1977. This application Oct. 4, 1977, Ser. No. 839,354

Claims priority, application Japan, Feb. 12, 1976, 51-14194; Feb. 26, 1976, 51-20328

Int. Cl.[2] A61K *31/42;* C07D *263/32*

U.S. Cl. 424—272 **7 Claims**

1. A 2-aminomethyl-5-phenyloxazole having the formula (I):

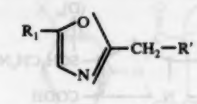


(I)

wherein R_1 is phenyl or halophenyl; R' is

wherein R_2 and R_3 are selected from the group consisting of hydrogen and C_1–C_{10} alkyl, and the pharmaceutically acceptable acid addition salt thereof.

7. A method of meliorating inflammation in warm blooded animals, which comprises administering to said animal an anti-inflammatory effective amount of a compound having the formula (I):



(I)

wherein R_1 is phenyl or halophenyl; R' is

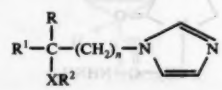
wherein R_2 and R_3 are selected from the group consisting of hydrogen and C_1–C_{10}alkyl, or the pharmaceutically acceptable acid addition salt thereof.

4,123,542
DERIVATIVES OF N-ALKYL IMIDAZOLES

Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jan. 19, 1977, Ser. No. 760,804
The portion of the term of this patent subsequent to Mar. 7, 1995, has been disclaimed.
Int. Cl.[2] C07D *233/60;* **A61K** *31/415*
U.S. Cl. 424—273 R **28 Claims**

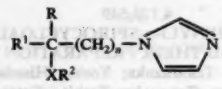
1. A compound of the formula:



(I)

wherein R is lower alkyl; R^1 is 4-halo or 2,4-dihalo substituted phenethyl or phenylpropyl; R^2 is halo and/or methoxy substituted benzyl or phenyl; X is oxygen or sulfur; *n* is an integer of from 1 to 4; and the antimicrobial addition salts thereof.

26. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing, or subject to attach by, fungi, bacteria or protozoa, an effective amount of a compound of the formula:



(I)

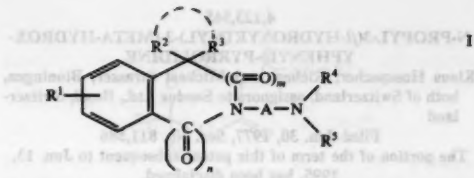
wherein R is lower alkyl; R^1 is 4-halo or 2,4-dihalo substituted phenethyl or phenylpropyl; R^2 is halo and/or methoxy substituted benzyl or phenyl; X is oxygen or sulfur; *n* is an integer of from 1 to 4; or an antimicrobial acid addition salt thereof, or a composition containing same as an active ingredient.

4,123,543
DERIVATIVES OF SUBSTITUTED INDOLINE LACTANS WITH EFFECT ON THE CENTRAL NERVOUS SYSTEM

Nils Å. Jönsson, Södertälje; Lembit Mikiver, Järna, and Pinchas Moses, Solna, all of Sweden, assignors to AB Kabi, Stockholm, Sweden

Continuation of Ser. No. 670,782, Mar. 26, 1976, which is a division of Ser. No. 288,027, Sep. 11, 1972, Pat. No. 3,947,451.
This application Mar. 30, 1976, Ser. No. 671,768
Int. Cl.[2] A61K *31/40;* **C07D** *209/96, 209/34*
U.S. Cl. 424—274 **20 Claims**

1. A pharmacodynamically active nitrogen containing heterocyclic compound of the general formula



I

in which $m = 1$ and $n = 0$,

A is an ethylene or a trimethylene group or such a group having a methyl substituent, or A signifies an acetyl group or such a group having an α-alkyl substituent having 1–4 carbon atoms, connected to the group

by the carbonyl CO linkage,

R^1 is hydrogen, halogen or a nitro group,

R^2 and R^3 are allyl or propargyl or saturated normal alkyl groups of up to 6 carbon atoms, which may be taken together with the carbon atom to which they are bonded to form a ring, which may be substituted by an oxo or a hydroxy group, R^4 and R^5 are hydrogen or alkyl radicals of at most 6 carbon atoms or R^4 and R^5 together with the nitrogen form a pyrrolidine ring, and where A does not signify a possibly alkylated acetyl group, the corresponding amine oxides and quaternary lower alkyl ammonium compounds, as well as salts of the basic compounds with non-toxic physiologically acceptable acids.

14. A pharmaceutical preparation for the treatment of depression containing as an active ingredient an anti-depression effective amount of a compound according to claim 1, together with a pharmaceutically acceptable carrier.

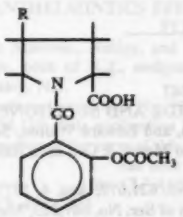
16. A method for the treatment of depression, comprising administering to a person in need thereof an anti-depression effective amount of a compound according to claim 1.

4,123,544
ACETYLSALICYLIC ACID DERIVATIVES

Henri Kornowski, Paris; Bernard Roques, St. Maurice; Robert Oberlin, Mantes LaVille, and André Jondet, St. Mande, all of France, assignors to Merrell Toraude S. A., Paris, France

Filed Mar. 2, 1977, Ser. No. 773,564
Int. Cl.[2] C07D *207/12;* **A61K** *31/40;* **C07D** *207/16*
U.S. Cl. 424—274 **2 Claims**

1. 1-(o-acetoxybenzoyl)-L-prolines of the formula:



where R is H or OH.

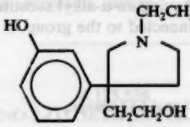
2. An analgesic, anti-inflammatory or antipyretic composition in dosage unit form consisting of from 100 mg to 1 g of a compound of claim 1 and a pharmaceutical carrier.

4,123,545
N-PROPYL-3(β-HYDROXYETHYL)-3-(META-HYDROXYPHENYL)-PYRROLIDINE

Klaus Hasspacher, Riehen, and Michael Strasser, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed Jun. 30, 1977, Ser. No. 811,586
The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.
Int. Cl.[2] C07D *207/44;* A61K *31/40*
U.S. Cl. 424—274 3 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt form thereof.

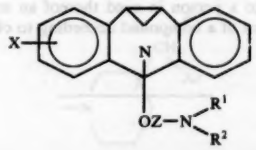
2. A method of treating psychotic disturbances in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,123,546
ANTIDEPRESSANT COMPOUNDS

Michael J. Haire, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 1, 1977, Ser. No. 812,405
Int. Cl.[2] A61K *31/40;* C07D *471/18*
U.S. Cl. 424—274 18 Claims

1. A compound of the formula



where

X is H, F, Cl, Br, C_{1-4} alkyl, C_{1-4} alkoxy, CF_3 or C_{1-4} alkyl sulfonyl;

Z is C_2–C_3 alkylene; and

R^1 and R^2 independently are H, C_{1-4} alkyl;

or its pharmaceutically suitable acid addition salt.

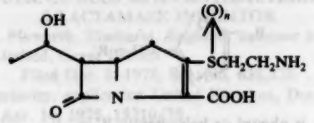
13. A method of alleviating depression in a mammal which comprises administering to the mammal as effective antidepressant amount of a compound of claim 1.

4,123,547
THIENAMYCIN SULFOXIDE AND SULPHONE

Burton G. Christensen, Metuchen, and Edward Walton, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 821,679, Aug. 4, 1977, abandoned, which is a continuation of Ser. No. 667,323, Mar. 16, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,620
Int. Cl.[2] C07D *487/04;* A61K *31/40*
U.S. Cl. 424—274 3 Claims

1. A compound having the structural formula:



wherein *n* is an integer selected from 1 or 2 and the non-toxic, pharmaceutically acceptable salts thereof.

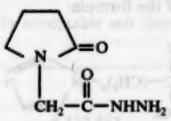
3. An antibacterial pharmaceutical composition comprising, in unitary dosage form, a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,123,548
(2-OXO-PYRROLIDINES)-ACETIC HYDRAZIDES

Fritz-Walter Lange, Gauting; Haireddin Jacobi, Leichlingen, and Jens Müller, Gauting, all of Fed. Rep. of Germany, assignors to Chemisches Laboratorium Fritz-Walter Lange GmbH & Co KG, Gauting, Fed. Rep. of Germany

Division of Ser. No. 661,138, Feb. 25, 1976, Pat. No. 4,069,336. This application Oct. 17, 1977, Ser. No. 842,908
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 2 Claims

1. (2-oxo-pyrrolidine-1) acetic hydrazide of the formula



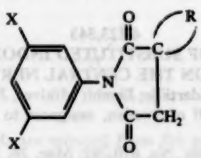
2. A pharmaceutical preparation useful as a psychopharmacon and for treatment of diseases occurring in the cerebral function region of the brain containing, as an active ingredient, an effective amount of a compound of claim 1, together with suitable pharmaceutically inert carrier and auxiliary substances.

4,123,549
N-(3,5-DIHALOPHENYL)-α-SPIROCYCLOALKANESUCCINIMIDES, AND THEIR PREPARATION AND USE

Nobuyuki Kameda, Takarazuka; Yoshio Hisada, Kawanishi; Chiyozo Takayama, Toyonaka; Toshiro Kato, Ibaraki, and Akira Fujinami, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

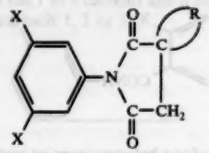
Filed Dec. 12, 1977, Ser. No. 859,756
Claims priority, application Japan, Feb. 7, 1977, 52-12800
Int. Cl.[2] A61K *31/40;* C07D *207/40*
U.S. Cl. 424—274 5 Claims

1. A compound of the formula:



wherein X is a chlorine or bromine atom and R is a C_3–C_6 alkylene group.

4. A fungicidal composition which comprises as an active ingredient a fungicidally effective amount of a compound of the formula:



wherein X is a chlorine or bromine atom and R is a C_3–C_6 alkylene group and an inert carrier.

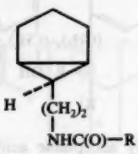
4,123,550

BICYCLO[3.1.0]HEXYLETHYLAMINOCARBONYL-SUBSTITUTED HETEROARYL CARDIOVASCULAR AGENTS

Karl G. Untch, Los Altos; Stefan H. Unger, Palo Alto, and Brian Lewis, Mountain View, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

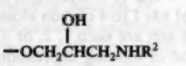
Filed Oct. 31, 1977, Ser. No. 846,959
Int. Cl.² A01N 9/00; C07D 333/24
U.S. Cl. 424—275 **15 Claims**

1. A compound of the formula:



where R is

where R^1 is the radical



wherein R^2 is C_1 to C_4 linear or branched alkyl, and pharmaceutically acceptable salts thereof.

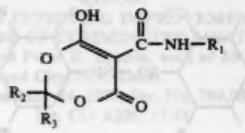
4,123,551

2,2-DISUBSTITUTED-PHENYLCARBAMOYL-6-HYDROXY-M-DIOXIN-4-ONE DERIVATIVES HAVING INSECTICIDAL PROPERTIES

Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 10, 1977, Ser. No. 758,260
Claims priority, application Switzerland, Jan. 14, 1976, 396/76; Jul. 28, 1976, 9639/76; Dec. 14, 1976, 15700/76
Int. Cl.² A01N 9/28; C07D 319/06, 319/08
U.S. Cl. 424—279 **5 Claims**

1. A method of controlling insects in crop plants and on productive livestock which method comprises applying to said plants and livestock or their environment an insecticidally effective amount of a compound of the formula



wherein R_1 is phenyl mono- or di- substituted by halogen, methyl or trifluoromethyl; and either R_2 is methyl or ethyl, and R_3 is methyl, or R_2 and R_3 together are tetramethylene or pentamethylene, with the proviso that when R_2 and R_3 both represent methyl groups or when R_2 and R_3 together represent a tetramethylene or pentamethylene group, R_1 may not represent 3-chlorophenyl, 4-chlorophenyl, 3,4-dichlorophenyl or 4-fluorophenyl.

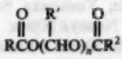
4,123,552

COMPOSITIONS FOR PRESERVING CROPS AND ANIMAL FEEDSTUFFS

Daniel L. Kensler, Jr., West Des Moines, Iowa; Gustave K. Kohn, Berkeley, Calif., and David D. Walgenbach, Brookings, S. Dak., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 468,629, May 9, 1974, Pat. No. 3,931,412, which is a continuation-in-part of Ser. No. 266,945, Jun. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,364, Sep. 11, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,940, Oct. 28, 1969, abandoned. This application Oct. 17, 1975, Ser. No. 623,287
Int. Cl.² A01N 9/24
U.S. Cl. 424—311 **4 Claims**

1. A composition useful for preventing the growth of fungi in crops and animal feedstuffs and for conserving the palatability and nutritional values of said crops and animal feedstuff comprising an oxidation inhibiting amount of an antioxidant selected from hindered phenols and dialkyl thiodipropionates and a fungicidally effective amount of bis-ester of the formula



wherein R and R^2 independently are alkyl of 1 to 6 carbon atoms, R′ is chloroalkyl of 1 to 4 carbon atoms and 1 to 5 chloro groups or alkaryl of 7 to 10 carbon atoms, and *n* is 1, 2 or 3, or a mixture thereof.

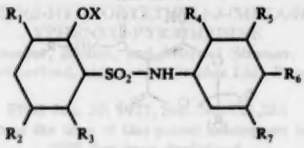
4,123,553

ANTHELMINTICS EFFECTIVE AGAINST LIVER FLUKES

Milan Mitrovic, Nutley, and Terence J. Hayes, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

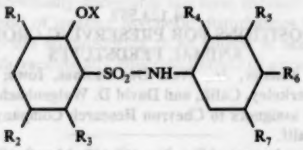
Continuation of Ser. No. 724,785, Sep. 20, 1976, Pat. No. 4,034,110. This application Mar. 7, 1977, Ser. No. 775,064
The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.
Int. Cl.² A61K 31/22, 31/18
U.S. Cl. 424—311 **12 Claims**

1. A composition for parenteral administration to an animal for treatment of *Fasciola hepatica* infections which comprises a non-toxic carrier material suitable for parenteral administration and an effective amount of an anthelmintic compound represented by the formula



wherein each of R_1 and R_2 are independently chlorine or bromine, R_3 is hydrogen or chlorine and each of R_4 through R_7 is independently hydrogen, halogen or trifluoromethyl, with the proviso that at least 2 of R_3 through R_7 is other than hydrogen and X is hydrogen or lower alkanoyl.

8. A composition for oral administration to an animal in the form of a bolus for treatment of *Fasciola hepatica* infections said bolus comprising suitable non-toxic carrier material and an effective amount of an anthelmintic compound represented by the formula



wherein each of R_1 and R_2 are independently chlorine or bromine, R_3 is hydrogen or chlorine and each of R_4 through R_7 is independently hydrogen, halogen or trifluoromethyl, with the proviso that at least 2 of R_3 through R_7 are other than hydrogen and X is hydrogen or lower alkanoyl.

4,123,554

FUNGICIDAL AND GERMICIDAL BENZANILIDES

Seigo Kawada, Fujieda; Yoshitaka Suda, Shizuoka; Shigeru Tsuchiya, Shimizu; Nobuya Ohta; Norimichi Muramatsu, both of Shizuoka, and Kazuo Nishio, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

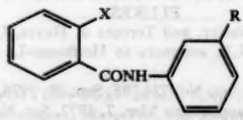
Continuation-in-part of Ser. No. 585,078, Jun. 9, 1975, abandoned. This application Nov. 11, 1976, Ser. No. 740,878

Claims priority, application Japan, Jun. 12, 1974, 49/66767; Jan. 21, 1975, 50/8981

Int. Cl.[2] **C07C** *103/78;* **A61K** *31/165*

U.S. Cl. 424—324 **16 Claims**

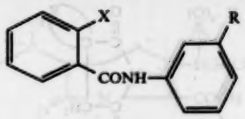
1. A benzanilide derivative having the following general formula (I):



(I)

wherein X stands for a halogen atom or a methyl radical; and R stands for an alkyl or alkoxy radical containing 3 to 6 carbon atoms provided that R represents an alkyl radical containing 3 to 6 carbon atoms when X is a methyl radical.

14. A method for killing fungi and germs on plants which comprises applying to plants or soil a fungicidally or germicidally effective amount of a benzanilide derivative represented by the general formula (I):



(I)

wherein X stands for a halogen atom or methyl radical; and R stands for an alkyl or alkoxy radical containing 3 to 6 carbon atoms provided that R represents an alkyl radical with 3 to 6 carbon atoms when X is a methyl radical.

4,123,555

SULFIDE COMPOUNDS AND METHODS AND COMPOSITIONS FOR TREATING DEPRESSION

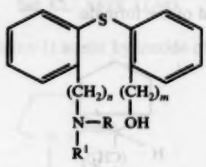
Nariman B. Mehta, and Lawrence E. Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, Jul. 21, 1975, Pat. No. 3,997,540. This application Nov. 12, 1976, Ser. No. 741,196

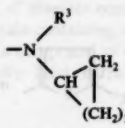
Int. Cl.[2] **A61K** *31/135;* **C07C** *87/29*

U.S. Cl. 424—330 **24 Claims**

1. A compound of the formula

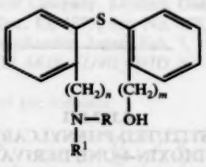


or a pharmaceutically acceptable acid addition salt thereof where NRR^1 is

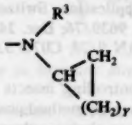


where Y is 3 or 4 and R is hydrogen or lower alkyl, in the above lower alkyl has 1 to 4 carbon atoms and n and m are the same or different and are each 1, 2, or 3.

16. The method of treating depression in a mammal which comprises administering to a depressed mammal an effective antidepressant amount of a compound of the formula



or a pharmaceutically acid addition salt thereof where NRR^1 is



where Y is 3 or 4 and R^3 is hydrogen or lower alkyl, in the

above lower alkyl has 1 to 4 carbons and n and m are the same or different and are each 1, 2 or 3.

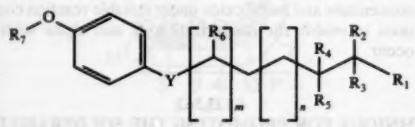
4,123,556

INSECTICIDAL COMPOSITION

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 414,033, Nov. 8, 1973, abandoned, which is a division of Ser. No. 328,218, Jan. 31, 1973, abandoned. This application Sep. 18, 1975, Ser. No. 614,394
Claims priority, application Switzerland, Feb. 4, 1972, 1695/72; Feb. 16, 1972, 2240/72
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—341 10 Claims

1. A method for combatting insects by inhibiting the development of the larvae, or pupae, thereof which comprises treating, by contact or ingestion, an immature form of said insect with a development inhibiting amount of a compound of the formula



wherein

R_1 represents hydrogen, halogen, C_1–C_4-alkyl, vinyl or ethynyl,

R_2 represents hydrogen, halogen, methyl or ethyl, or

R_1 and R_2 together represent the cyclopentyl or cyclohexyl ring,

R_3 represents hydrogen, halogen, methyl, ethyl or C_1–C_4-alkoxy,

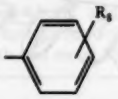
R_4 represents hydrogen, halogen or methyl,

R_5 represents hydrogen or halogen, or

R_3 and R_5 together represent a carbon-carbon bond,

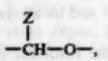
R_6 represents hydrogen, methyl or ethyl,

R_7 represents cyclohexyl or the group

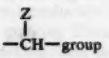


R_8 represents hydrogen, halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy,

Y represents oxygen, or the group



whereby the



is bound to the phenyl ring,

Z represents hydrogn or methyl, and

m and *n* each represent the number 0 to 1.

4,123,557

MEANS FOR EFFECTING IMPROVEMENT IN THE MANUFACTURE OF COMMINUTED MEAT PRODUCTS

Felix Epstein, and Peter R. Epstein, both of 33-33 Greenpoint Ave., Long Island City, N.Y. 11101

Filed May 24, 1977, Ser. No. 799,984
Int. Cl.[2] A22C *11/00*
U.S. Cl. 426—105 8 Claims

1. In a comminuted meat product comprising flesh meat, fat and water, the improvement which includes an effective amount of a binding agent comprising lactose and proteins of milk, the proteins being the serum proteins and solubilized casein in the respective ratio of about 1:1 by weight, and the ratio of lactose-to-proteins being, respectively, 38–50 to 28–35 parts by weight.

4,123,558

COATING OF POTATOES TO PREVENT GREENING

Peter A. Poapst, Kentville, and Frank R. Forsyth, Berwick, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 498,813, Aug. 19, 1974, abandoned. This application Jul. 9, 1976, Ser. No. 703,886
Claims priority, application Canada, Aug. 8, 1975, 233131
Int. Cl.[2] A23B *7/16*
U.S. Cl. 426—268 11 Claims

1. A method for treating, raw, unpeeled, cold-stored potato tubers to inhibit greening due to chlorophyll development which comprises applying a mixture consisting essentially of water and as active anti-greening agent one of (a) an effective amount up to about 15% of the mixture of a non-toxic or food grade surfactant or (b) a mixture of said surfactant with an organic acid which is selected from the group consisting of mono- or polycarboxylic acids having from 2 to 6 carbon atoms and at least one hydroxy or oxo group, and lactones thereof, excepting those dicarboxylic acids which readily form internal anhydrides, to said tubers in a quantity which is sufficient upon drying to form a thin continuous micelle containing film of said surfactant thereon; said surfactant consisting essentially of long chain fatty acid moieties, and at least one of polyoxyalkylene and polyhydroxy moieties and having an HLB rating below about 15.

4,123,559

PROCESS FOR THE PRODUCTION OF SPICE EXTRACTS

Otto Vitzthum, and Peter Hubert, both of Bremen, Fed. Rep. of Germany, assignors to Studiengesellschaft Kohle mbH, Mulheim, Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 560,432, Mar. 20, 1975, abandoned, which is a continuation of Ser. No. 258,586, Jun. 1, 1972, abandoned. This application Dec. 27, 1976, Ser. No. 754,803
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1971, 2127611
Int. Cl.[2] A23L *1/22, 1/221*
U.S. Cl. 426—312 9 Claims

1. A process for the production of spice extracts from natural spice which comprises the steps of:

(a) contacting a solvent gas, which in the dry supercritical state is effective to dissolve the essential oil component containing aroma constituents from the natural spice and leave a first spice residue containing flavor constituents, with the natural spice, for a time sufficient to extract the essential oil component of the spice and leave a first spice residue containing flavor constituents, the solvent gas being in dry supercritical state,

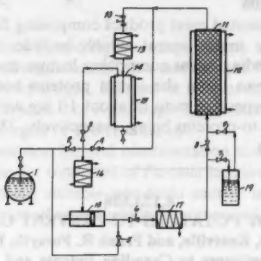
(b) separating the aroma constituents from the solvent gas,

(c) contacting a solvent gas, which in the wet supercritical condition is effective to dissolve the flavor constituents of the natural spices and leave a second spice residue, with the first spice residue, for a time sufficient to extract the flavor constituents of the first spice residue and leave said

second spice residue, the solvent gas being in wet supercritical state,

(d) separating the flavor constituents from the extraction solvent gas of step c,

wherein the solvent gas in each of steps (a) and (c) is selected from the group consisting of carbon dioxide; saturated and



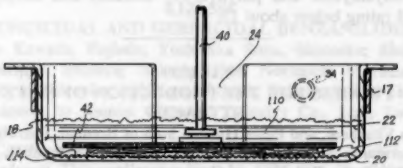
unsaturated hydrocarbons containing up to about three carbon atcms; nitrous oxide; saturated and unsaturated halogenated hydrocarbons containing up to about three carbon atoms wherein the halogen is at least one of flourine and chlorine; sulfur hexaflouride and mixtures thereof.

4,123,560

METHOD FOR FLASH COOKING FOOD

Jaxon O. Hice, Clover, S.C., assignor to Research Associates Ltd., Charlotte, N.C.

Filed Jun. 8, 1977, Ser. No. 804,492
Int. Cl.[2] A23L *1/01*
U.S. Cl. 426—509 **7 Claims**



1. A method of flash cooking a portion of food, comprising the steps of:

(a) providing a cooking surface which is generally flat but contoured such that it retains a small quantity of cooking liquid collected at one face of said cooking surface;

(b) pressing said food portion against said cooking surface with a sufficient compressive force to maintain said collected liquid between said cooking surface and said food portion;

(c) causing said compressed food portion to be submerged in a volume of cooking liquid, while

(d) applying external heat directly to the other face of said cooking surface to raise the temperature of said cooking surface to a level which will (i) vaporize said liquid collected between said food portion and said cooking surface; (ii) cause cooking of said food portions pressed against said cooking surface by applying the heat of said cooking surface directly to said food portion; and (iii) raise the temperature of said cooking liquid to cause additional cooking of said food portion without burning the food.

4,123,561

METHOD FOR PROCESSING HOPS FOR BREWING

Herbert L. Grant, Yakima, Wash., assignor to S.S. Steiner, Inc., New York, N.Y.

Filed Feb. 1, 1977, Ser. No. 764,600
Int. Cl.[2] C12C *9/02*; C07C *45/00, 49/00*
U.S. Cl. 426—600 **29 Claims**

1. A method for processing powdered hops which stabilizes the hops and the alpha acids present against deterioration, said method comprising the steps of:

(i) mixing a hops powder or hops powder concentrate, said powder or powder concentrate containing alpha acids, with one or more oxides of a divalent metal suitable for use in food products, so as to intimately contact said metal oxide with the alpha acids under conditions insufficient to form a solution; and

(ii) maintaining said mixture of hops powder or powder concentrate and metal oxide under suitable reaction conditions to enable said hops powder or powder concentrate and said alpha acids to become stabilized.

10. A method for isomerizing the alpha acids contained in powdered hops, said method comprising the steps of:

(i) mixing a hops powder or hops powder concentrate, said powder or powder concentrate containing alpha acids, with one or more oxides of a divalent metal suitable for use in food products, so as to intimately contact said metal oxide with the alpha acids under conditions insufficient to form a solution; and

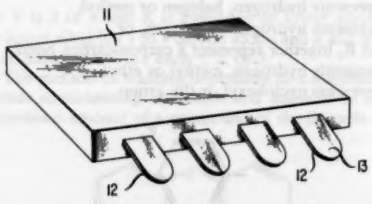
(ii) maintaining said mixture of hops powder or powder concentrate and metal oxide under suitable reaction conditions to enable the isomerization of said alpha acids to occur.

4,123,562

TECHNIQUE FOR PROMOTING THE SOLDERABILITY OF A METAL SURFACE

Edwin A. Chandross, Berkeley Heights, and Coralie A. Pryde, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

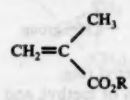
Division of Ser. No. 584,869, Jun. 9, 1975, Pat. No. 3,998,993. This application Nov. 1, 1976, Ser. No. 737,405
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—58 **3 Claims**



1. Method for promoting the solderability of a metal surface to at least a portion of which electrical connections are to be made by soldering which comprises the steps of

(a) dipping a cleansed metal surface selected from the group consisting of copper and its alloys in an aqueous benzotriazole solution,

(b) depositing upon the resultant cleansed metal surface a thin layer of polymer selected from the groups consisting of homopolymers formed by polymerization of a methacrylate monomer of the general formula



wherein R is selected from the group consisting of alkyl radicals of the general formula C_nH_{2n+1} wherein n is an integer from 1–6, and copolymers formed solely by copolymerization of methacrylate monomers of said general formula wherein R is selected from the group consisting of alkyl radicals of the general formula C_nH_{2n-1} wherein n is an integer from 1–6, and a glycidyl radical, the said glycidyl monomer being present in said copolymer in an amount ranging up to 10 percent, by weight, and

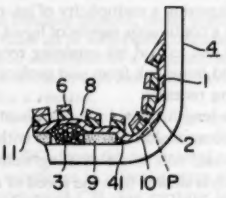
(c) heating the resultant assembly to a temperature within the range of 85°–115° C. for a time period ranging from 15–30 minutes, so resulting in a coating on said surface having a thickness ranging from 1–2 microns.

4,123,563

PROCESS FOR THE PRODUCTION OF COLOR TELEVISION PICTURE TUBES

Koichi Mitobe, Chiba, and Yasuhiko Uehara, Mobara, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 23, 1977, Ser. No. 771,244
Int. Cl.² H01J *31/20*; C03C *17/32, 17/30*
U.S. Cl. 427—68 **1 Claim**



1. In a process for the production of color television picture tubes which comprises at least the step of forming a phosphor layer on the inner surface of a panel, the step of coating said inner surface of the panel including said phosphor layer with an aqueous emulsion of a water-insoluble film-forming resin to form a volatilizable substrate layer, the step of forming a metal film on the substrate layer and the step of volatilizing the organic substances, the improvement characterized by forming said substrate layer from at least two layers each of an emulsion, drying the resulting respective film coatings of emulsion after formation thereof, adding 0.1 to 3.0% by weight colloidal silica, 0.05 to 1.00% by weight of an aqueous ammonium oxalate solution (concentration 25% by weight) and 0.5 to 1.0% by weight aqueous hydrogen peroxide (concentration 35% by weight) to the first layer emulsion, and adding 0.5 to 5.0% by weight polyvinyl alcohol-boric acid complex and a small amount of ammonium hydroxide to the emulsion of the layer contacting directly with said metal film.

4,123,564

METHOD OF PRODUCING SEMICONDUCTOR DEVICE

Takashi Ajima, Tokyo; Kiyoshi Takaoki, Yokohama, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 746,897
Claims priority, application Japan, Dec. 3, 1975, 50/144254
Int. Cl.² B05D *5/12*; H01L *21/22*
U.S. Cl. 427—85 **21 Claims**

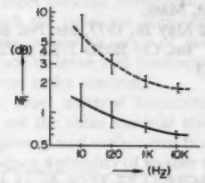
1. A method of producing a semiconductor device, comprising the steps of: .

forming all desired semiconductor regions in a semiconductor substrate using masking films;

removing all of the masking films used in forming the desired semiconductor regions within the semiconductor substrate to expose the entire surface of the semiconductor substrate;

forming a first insulation film on the exposed surface of the substrate;

selectively forming a polycrystalline silicon film on the surface of the first insulation film to provide covered and



uncovered portions of the first insulation film at predetermined locations; and

forming a second insulation film selectively at least on the uncovered portions of the first insulation film by using the selectively formed polycrystalline silicon film

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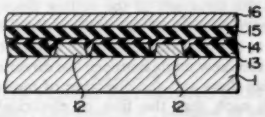
4,123,565

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Yasusuke Sumitomo, Yokohama, and Yoshie Ohashi, Fujisawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 748,897
Claims priority, application Japan, Dec. 10, 1975, 50-146368
Int. Cl.² B05D *5/12, 3/12*
U.S. Cl. 427—88 **6 Claims**



1. A method for manufacturing a semiconductor device, comprising the steps of: (a) forming a first insulating layer and a first wiring layer on one surface of a semiconductor substrate, said first wiring layer being formed on at least a portion of the one surface of the semiconductor substrate where the first insulating layer is not formed and having substantially the same thickness as that of the first insulating layer; (b) forming an insulating film flat on the first insulating and wiring layers by coating and then burning a liquid insulating material on the first insulating and wiring layers so that the liquid material occupies grooves between the first insulating and wiring layers; (c) forming an intermediate insulating layer on the insulating film; and (d) forming a second wiring layer on the intermediate insulating layer.

4,123,566

NA/S CELL REACTANT CONTAINER WITH METAL ALUMINIDE COATING

Debajyoti Chatterji, Latham, and Robert R. Dubin, Charlton, both of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Division of Ser. No. 752,369, Dec. 20, 1976, Pat. No. 4,048,390.
This application Jun. 23, 1977, Ser. No. 809,217
Int. Cl.² B05D *5/12*; C23C *13/02*
U.S. Cl. 427—115 **3 Claims**

1. In a method for fabricating a sodium sulfur battery having iron, cobalt or nickel based container or component surfaces and operable at temperatures of 300° C. or higher, where said container or component surface is exposed to sulfur-sodium polysulfide melts, the improvement which comprises:

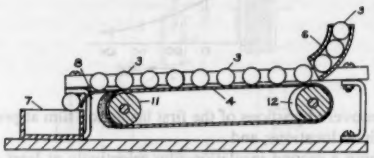
aluminiding said surfaces prior to fabrication of said battery.

4,123,567

PROCESS FOR APPLYING ELECTRODES TO THE SURFACES OF ELECTROACOUSTIC TRANSDUCER ELEMENTS SUCH AS CERAMIC DISCS

Frank Massa, Cohasset, Mass., assignor to Donald P. Massa & Fred M. Dellorfano, Jr. Trustees of The Stonleigh Trust u/d/t, Cohasset, Mass.

Filed May 26, 1977, Ser. No. 800,710
Int. Cl.[2] B05D 5/12, 3/12
U.S. Cl. 427—123 5 Claims



1. A process for applying electrically conducting surfaces to the opposite flat surfaces of a plurality of thin disc-shaped electroacoustic transducers which includes the following steps:

(a) Coat the entire disc, including the edge, with a film of electrically conducting material,

(b) Place the coated discs individually into a slot-like guide which holds the discs with their plane surface approximately at right angles to the moving surface of an abrasive belt which is located to serve as a bottom for said slot-like guide,

(c) Provide means for causing the discs to roll along the slot-like guide,

(d) Provide alignment means for the slot-like guide which controls the direction of the rolling discs, such that the direction of motion of the rolling discs is skewed with relation to the direction of motion of the abrasive surface,

(e) Adjust the skew angle between the direction of motion of the rolling discs and the direction of motion of the abrasive belt such that the film of electrically conducting material is completely removed from the edges of the discs as they roll along the slot-like guide.

4,123,568

METHOD OF MANUFACTURING AN IRON ELECTRODE FOR ALKALINE ACCUMULATORS

Viktor Evmenievich Kononenko, poselok Akkumulyator, 31, kv. 7; Valentina Nikolaevna Tamazina, ulitsa Radischeva, 71/1, kv. 20, and Alla Ivanovna Ozerova, ulitsa Vtoraya Rabochaya, 2/41, kv. 28, all of Kursk, U.S.S.R.

Filed Jun. 1, 1976, Ser. No. 691,887
Int. Cl.[2] H01M 4/04, 4/26
U.S. Cl. 427—126 1 Claim

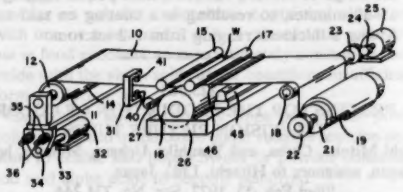
1. A method of manufacturing an electrode for an alkaline accumulator by applying on to a grid made of a steel band, a mass consisting essentially of a mixture of black iron ore concentrate, Fe_3O_4, in the amount of 95 parts by weight, iron oxide, Fe_2O_3, in the amount of 5 parts by weight, synthetic fibre in an amount of 0.1 to 0.2 parts by weight, FeS, in the amount of 1.05 to 1.25 parts by weight, aqueous nickel sulfate in the amount of 12.5 parts by weight, a surface active agent in the amount of 9 parts by weight, and adding an aqueous solution of polyvinyl alcohol in the amount of 2 parts by weight mixed with concentrated sulfuric acid in a weight ratio of 1 to 5 with respect to said polyvinyl alcohol, wherein said parts by weight refer to the total mass, rubbing the resulting activated mass into said grid and drying for 15 to 30 minutes at a temperature within the range of from 110° to 180° C.

4,123,569

DIRECT RIBBON INKING BY GRAVURE

Glenn E. Peterson, Carle Place; Robert T. Emerson, Manhasset, and William J. Schoenlein, Levittown, all of N.Y., assignors to Columbia Ribbon & Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Division of Ser. No. 676,301, Apr. 12, 1976, Pat. No. 4,048,952.
This application May 25, 1977, Ser. No. 800,385
Int. Cl.[2] B41J 31/14
U.S. Cl. 427—141 7 Claims



1. A method for applying liquid ink to an ink-absorbent web comprising the steps of:

(a) providing a rotatable ink-applicator gravure roll having a surface comprising a multiplicity of ink-retaining recesses;

(b) providing a continuous supply of liquid ink to the surface of said roll and to said ink-retaining recesses thereon;

(c) wiping said liquid ink from said surface except from said ink-retaining recesses;

(d) moving a length of said ink-absorbent web, under tension, into compression-free contact with the ink-carrying surrace of said roll while rotating said roll at a surface speed which is slower than the speed of movement of said web in contact therewith to cause said web to wipe over the surface of said ink roll and to absorb sufficient liquid ink from said ink-retaining recesses to satisfy the absorbency of the web; and

(e) collecting said length of inked web onto a wind-up roll.

4,123,570

PREPARATION OF UREAFORM

Willy H. P. Van Hijfte, Assenede; Luc A. Vanmarcke, Lembeke, and Anton Niks, Rixensart, all of Belgium, assignors to Compagnie Neerlandaise de l'Azote (Societe Anonyme), Brussels, Belgium

Filed Jun. 29, 1977, Ser. No. 811,434
Claims priority, application United Kingdom, Jul. 2, 1976, 27759/76
Int. Cl.[2] C05C 1/02, 7/00, 9/02
U.S. Cl. 427—222 8 Claims

1. A process for preparing ureaform granules, which comprises mixing a concentrated aqueous solution of a urea-formaldehyde condensate with a catalyst comprising a salt of a strong inorganic or organic acid and a weak, volatile or nonstable base, which salt at normal temperature effects no or virtually no acid condensation, but at elevated temperature releases so much strong acid as to effect the acid condensation in at most a few seconds, spraying the mixture of solution and catalyst over solid ureaform particles which are kept in spaced interrelationship and at such an elevated temperature that the catalyst is decomposed and acid condensation is effected, whereby the sprayed particles are coated with a layer of ureaform and dried.

4,123,571

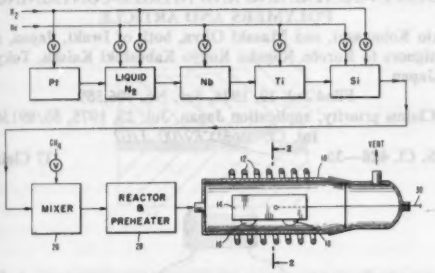
METHOD FOR FORMING SMOOTH SELF LIMITING AND PIN HOLE FREE SIC FILMS ON SI

Moshe Balog, Jerusalem, Israel; Melvin Berkenblit, Yorktown Heights, N.Y.; See-Ark Chan, Croton-on-Hudson, N.Y., and Arnold Reisman, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,561

Int. Cl.[2] B44D *1/14, 1/18*

U.S. Cl. 427—249 12 Claims



1. A method for forming smooth, dense highly adherent and pin hole free SiC films on Si substrates comprising the steps of:

(a) placing said Si substrates in a tantalum susceptor coated with tantalum carbide, said susceptor having the effect of floating within a reactor,

(b) having said Si substrates at atmosphere pressure in a pure He ambient at a temperature and for a time sufficient to remove native SiO_2 from the surfaces of said substrates,

(c) cooling the substrates to a temperature of about 900° C.

(d) flowing a preheated CH_4/He mixture into said reactor while maintaining said temperature at about 900° C. for a time sufficient to crack methane whereby a coating of C is deposited on said substrates, said CH_4 being present in the amount from about 0.8×10^{-3} to about 2.4×10^{-3} moles/-liter of the mixture;

(e) stopping the flow of CH_4 and heating said substrates in a pure He ambient to a temperature and for a time sufficient to form SiC films of desired thickness on said substrates; and thereafter

(f) slowly cooling said substrates to room temperature.

4,123,572

CUTTING SHEET MATERIAL HAVING TACKY LAYER THEREON

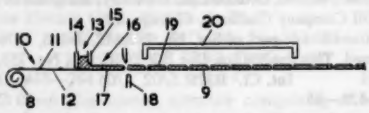
John A. F. Gidley, Sutton Coldfield, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Aug. 23, 1976, Ser. No. 716,455

Claims priority, application United Kingdom, Sep. 2, 1975, 36124/75

Int. Cl.[2] B05D *3/12, 1/32*

U.S. Cl. 427—272 15 Claims



1. A method of making a plurality of sheet material blanks each having a surface thereof uniformly coated with a tacky photopolymerizable layer, the method comprising the steps of:

(a) passing a long length of said sheet material horizontally through a first station in which tapes are located at desired longitudinally spaced-apart locations on said surface of the sheet material transversely to the direction of passage of said sheet material through said first station,

(b) passing said sheet material with said tapes thereon horizontally through a second station at which a continuous layer of uniform tacky photopolymerizable material is applied to said surface at a constant thickness and over said tapes whereby said tapes mask transverse regions of said surface,

(c) passing said sheet material horizontally through a third station in which the tapes are removed from the sheet material thereby removing strips of said tacky material from said surface to leave said transverse regions of said surface free from tacky material,

(d) passing said sheet material horizontally past cutting means which cut the sheet material transversely in said transverse regions of said surface free from tacky material thereby to produce a plurality of smaller sheets of material each having on a surface thereof a uniform tacky photopolymerizable layer.

4,123,573

METHOD FOR IMPARTING FLAME RETARDANT PROPERTY TO CELLULOSIC CONTAINING MATERIAL

George M. Wagner, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation of Ser. No. 715,763, Aug. 19, 1976, abandoned, which is a continuation of Ser. No. 537,525, Dec. 30, 1974, abandoned. This application Jun. 20, 1977, Ser. No. 808,015

Int. Cl.[2] D06M *13/44*

U.S. Cl. 427—324 7 Claims

1. A method of imparting flame retardant character to cellulosic containing material which includes at least 20 percent by weight of a polyester by applying an effective fire retarding imparting amount of a phosphorus composition to the material and curing the phosphorus composition, the improvement which comprises pretreating the cellulose containing material with from about 1 to about 10 percent by weight of an aqueous caustic solution prior to applying the phosphorus composition.

4,123,574

PROCESS FOR FLAME RETARDING CELLULOSICS

George M. Wagner, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 628,678, Nov. 3, 1975, Pat. No. 4,068,026, which is a continuation-in-part of Ser. No. 493,815, Aug. 1, 1974, Pat. No. 3,933,122, which is a division of Ser. No. 244,574, Apr. 17, 1972, Pat. No. 3,846,155. This application Sep. 2, 1976, Ser. No. 720,030

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.[2] C09K *3/28;* B05D *3/04*

U.S. Cl. 427—341 23 Claims

1. A process for rendering cellulosic-containing materials durably flame retardant comprising:

a. Impregnating a cellulose-containing material with a flame retarding solution comprising from about 10 to about 40 percent by weight poly(hydroxymethyl) phosphonium cation and from about 0.5 to about 20 percent by weight of a basic catalyst, said solution having a pH of from about 2 to about 9;

b. Drying the impregnated material at a temperature of less than 125° C., to a moisture content of from about 0 to about 8 percent by weight;

c. Aerating the dried material by directing a current of air from about 1,000 to about 3,000 cubic feet per minute through the dried material to eliminate any formaldehyde formed in said drying step;

d. Exposing the aerated material in an enclosed chamber for a period of at least about 5 seconds but less than about 60 seconds to an atmosphere containing at least about 50 percent by volume of gaseous ammonia to cure the phosphorus containing resin in and on the material;

e. Contacting the material with water to a wet pick-up of from about 10 to about 60 percent by weight to render the material durably flame retardant; and

f. Further exposing the water contacted material for a period of from about 1 to about 10 seconds to an atmosphere containing at least about 50 percent by volume of gaseous ammonia.

4,123,575

FIRE-RETARDING EPOXY RESIN MATERIAL, METHOD FOR THE MANUFACTURE THEREOF AND USE THEREOF AS COATING COMPOSITION

Ludwig Wesch, Gorresstrasse 54, Heidelberg, Germany; Luis C. Roma, C/Montserrat 22, Sabadell, and Carlos F. Pellicer, C/Balmes 454 s/a, Barcelona, both of Spain

Filed Feb. 2, 1977, Ser. No. 764,849

Claims priority, application Spain, Feb. 3, 1976, 444,862

Int. Cl.[2] C09K *3/28;* **B05D** *3/04;* **C08L** *63/02*

U.S. Cl. 427—386 **17 Claims**

1. A fire-retarding foam-forming epoxy resin composition suitable for protecting substrates as an applied layer thereon, said composition comprising essentially of an epoxy resin containing at least one amine curing agent and the following ingredients:

about 30% to 70% by weight referred to the epoxy resin-curing agent content of at least two members containing 20 mol% nitrogen and/or phosphorus selected from the group consisting of cyclic, aliphatic, aromatic, alicyclic-aromatic polyamines having a molecular weight of about 100 to 400 and melamine phosphate, quanidine phosphate, guanylurea phosphate, melamineborate, guanidine carbonate and benzosulfohydrazide, said epoxy composition optionally containing fillers,

said members having a decomposition temperature of about 100° C to 400° C and being characterized in that the decomposition of each member differs from each other by at least about 50° C.

8. A fire-retarding foam-forming epoxy resin composition in the form of a coating comprising a plurality of cured layers on a substrate, said composition comprising essentially of an epoxy resin containing at least one amine curing agent and the following ingredients:

about 30% to 70% by weight referred to the epoxy resin-curing agent content of at least two members containing 20 mol% nitrogen and/or phosphorus selected from the group consisting of cyclic, aliphatic, aromatic, alicyclic-aromatic polyamines having a molecular weight of about 100 to 400 and melamine phosphate, guanidine phosphate, guanylurea phosphate, melamine borate, guanidine carbonate and benzosulfohydrazide, said epoxy composition optionally containing fillers,

said members having a decomposition temperature of about 100° C to 400° C and being characterized in that the decomposition of each member differs from each other by at least about 50° C,

and characterized by at least one protective layer of polyurethane over said cured coating of epoxy resin composition.

9. A method of protecting a substrate with a fire-retarding epoxy resin composition coating which comprises, formulating said composition by mixing said epoxy resin with at least one amine curing agent and then adding thereto the following ingredients,

about 30% to 70% by weight referred to the epoxy resin-curing agent content of at least two members containing 20 mol% nitrogen and/or phosphorus selected from the group consisting of cyclic, aliphatic, aromatic, alicyclic-aromatic polyamines having a molecular weight of about 100 to 400 and melamine phosphate, guanidine phosphate, guanylurea phosphate, melamine borate, guanidine carbonate and benzosulfohydrazide, said epoxy composition optionally containing fillers,

said members having a decomposition temperature of about 100° C to 400° C and being characterized in that the decomposition of each member differs from each other by at least about 50° C,

and applying a plurality of layers of said composition as a coating to the substrate to be protected and curing said composition.

4,123,576

BONDING A MULTI-LAYERED STRUCTURE OF OLEFIN-CONTAINING AND NITRILE-CONTAINING POLYMERS AND ARTICLE

Akio Kobayashi, and Masaki Ohya, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1976, Ser. No. 706,559

Claims priority, application Japan, Jul. 23, 1975, 50/89130

Int. Cl.[2] B65D *89/00, 1/02*

U.S. Cl. 428—35 **17 Claims**

1. A synthetic-resin laminated structure comprising a first layer of a nitrile-containing polymer (I) comprising 40 to 90 mol percent of a unit of at least one member of acrylonitrile and methacrylonitrile, a second layer of a polymer mixture (II) comprising a nitrile-containing polymer (A) comprising 20 to 90 mol percent of a unit of at least one member of acrylonitrile and methacrylonitrile and an olefin-containing polymer of substantially no nitrile content (B) blended together, and a third layer of an olefin-containing polymer of substantially no nitrile content (III), said first, second and third layers being fused together in a laminated form with the second layer interposed between the first and third layers, and the 180° peel strength between the first layer and the third layer being at least 30 g/cm according to A.S.T.M. D903.

4,123,577

PRIMARY BACKING FOR TUFTED CARPETS AND CARPETS MADE THEREFROM

Morton I. Port, London, England; Juergen Nebe, and Bernhard H. Ladeur, both of Gronau-Epe, Germany, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 703,612, Jul. 8, 1976, abandoned. This application Dec. 22, 1976, Ser. No. 753,403

Int. Cl.[2] B32B *5/02, 5/06*

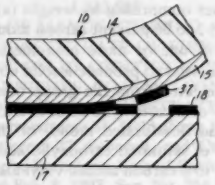
U.S. Cl. 428—95 **30 Claims**

1. An article suitable for use as a primary backing for tufted carpets comprising a substrate and a web having a weight per square meter of at least about 3 grams bonded thereto which web comprises about 5% to 100% by weight of a first fiber component which is heat bonded to said substrate and which has a denier of at least about 1.2 dtex and a fiber length of at least about 5 millimeters, and about 95% to 0.0% by weight of a second fiber component which is bonded to said first fiber component and which has a denier of at least about 1.2 dtex, and a fiber length of at least about 5 millimeters.

4,123,578
TRANSFER LETTER SYSTEM

Kenneth J. Perrington, New Brighton; Phillip A. Taylor, Lake Elmo, and Peter J. Vogelgesang, Roseville, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 420,310, Nov. 29, 1973, which is a continuation-in-part of Ser. No. 318,257, Dec. 26, 1972, abandoned. This application Aug. 3, 1976, Ser. No. 711,366
Int. Cl.[2] G03C 5/16; B41B 13/00
U.S. Cl. 428—206 22 Claims



1. A composite strip material for composing graphics such as letters, numbers, symbols or pictures in accordance with patterns of radiation, the strip material comprising:

an accepting tape comprising a layer of latent adhesive material, which adhesive material is nontacky at normal room temperature, but is softened and activated when heated to a temperature range somewhat above normal room temperature;

a donor web;

a friable layer of microgranules of up to 5 microns average diameter releasably adhered to the doner web and in face-to-face contact with the layer of adhesive material, said microgranules having a softening temperature above that of the adhesive material;

at least one of said layers bearing a radiation absorbing pigment; and

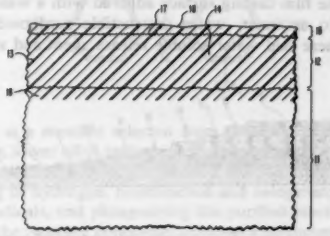
the composite strip material being essentially transparent to radiant energy between one exterior surface and said pigment to afford exposure of the pigment by momentary radiation so that the pigment is selectively heated in accordance with the pattern or radiation and momentarily softens the adjacent portions of the layer of adhesive material which then adheres to microgranules so that upon separation of the accepting tape and donor web, the microgranules are carried to the accepting tape only in irradiated areas.

4,123,579
RESIN COATED SUBSTRATE USING A SHORT-SET, HIGH-FLOW MELAMINE-FORMALDEHYDE IMPREGNATING RESIN

Harold O. McCaskey, Jr., Allendale, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 30, 1977, Ser. No. 782,697
Int. Cl.[2] B32B 27/42; C08G 12/38
U.S. Cl. 428—264 10 Claims

1. A resin film coated substrate comprising at least one substrate layer impregnated with resin and having a continuous film on its surface of dried, catalyzed, uncured resin, the resin consisting essentially of the reaction product of 1 mole of melamine, 1.8 moles to 2.7 moles of uninhibited formaldehyde and 0.05 mole to 0.40 mole of urea; the resin, prior to drying, having had a solids content of between about 40 wt.% to about 60 wt.%, a pH of between about 8 to about 10.5 and a water dilutability of between about 85% to about 195%; wherein the resin content of the substrate is between about 50 wt.% to about 85 wt.%, and the dried continuous film on the surface of the substrate layer will cure within about 30 seconds to about 90 seconds, under pressures of between about 150 psi. to about



500 psi., and remain on the surface of the substrate after pressing without the formation of a discontinuous film.

4,123,580
COLOR SOURCE SHEET WITH RUBBER BINDER

Victor R. Franer, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

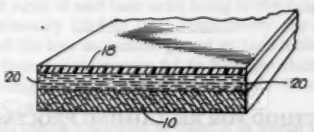
Filed Jun. 23, 1977, Ser. No. 809,320
Int. Cl.[2] B44D 1/18
U.S. Cl. 428—304 5 Claims

1. A color source sheet consisting of a thin porous paper having on one surface a thin uniform coating comprising a rubber binder in which is dispersed particulate heat-volatilizable dye and a particulate filler which is non-absorptive of said dye, wherein said particulate filler has a major dimension no greater than about 35 microns.

4,123,581
SELF-ADHERING STENCIL

Abraham D. Davis, Dolton, and Kenneth W. Pinter, Mundelein, both of Ill., assignors to A. B. Dick Company, Niles, Ill.

Filed Nov. 18, 1976, Ser. No. 742,903
Int. Cl.[2] B32B 5/18, 29/00; B41N 1/24
U.S. Cl. 428—318 1 Claim



1. A self-adhering stencil comprising a porous stencil base tissue, a stencilizable layer present as a coating on the stencil base tissue and a heat sensitive adhesive material present as an outer layer on the stencilizable layer in an amount sufficient to yield a heat bond of minimum peel strength for bonding the stencil to a separate substrate.

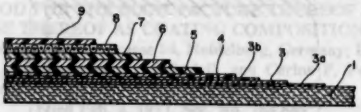
4,123,582
BUILDING FORM FOR MOLDED ARTICLES HAVING A URETHANE COATING

William Musyt, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 379,639, Jun. 13, 1973, abandoned, which is a continuation of Ser. No. 153,085, Jun. 14, 1971, abandoned, which is a continuation of Ser. No. 789,111, Jan. 2, 1969, abandoned. This application Mar. 28, 1977, Ser. No. 781,608
Int. Cl.[2] B32B 27/10, 29/06
U.S. Cl. 428—335 1 Claim

1. In a cardboard building form for preparing molded articles by spray coating a polyurethane reaction mixture thereon, curing the reaction mixture to form a molded article and re-

moving it therefrom by water-destructing the building form, the improvement which comprises, in sequence, an outer, water soluble release agent coating over a water permeable cellophane film casting surface adhered with a water soluble cement to an inner, water destructible cardboard support layer, where said water soluble release agent and said water



soluble cement are selected from at least one of sugar, polyvinyl alcohol, and methyl cellulose, and where said cellophane film has a water permeability of about 4000 to about 8000 grams per 100 square meters per 24 hours according to ASTM Test E96E and a thickness of from about 0.0005 to about 0.002 inch.

4,123,583

FILAMENTARY REINFORCEMENT PRODUCT

Harold E. DeBolt, Andover, Mass., assignor to Avco Corporation, Wilmington, Del.

Division of Ser. No. 634,478, Nov. 24, 1975, Pat. No. 4,045,597, which is a continuation-in-part of Ser. No. 230,867, Mar. 1, 1972, abandoned. This application May 23, 1977, Ser. No. 799,249

Int. Cl.[2] B32B *9/00*; D02G *3/36*

U.S. Cl. 428—336 **4 Claims**

1. A filamentary product consisting of in cross section:

a core of amorphous carbon;

an integral skin layer of highly-oriented graphite having boron, dispersed therein, said graphite being formed by the catalytic conversion of the surface region of the amorphous carbon filament; and

an outer layer of boron deposited on the integral skin layer.

4,123,584

METHOD FOR RECLAIMING PROCESSED THERMOSETTING PLASTIC COMPOUNDS

Lee K. Brewton, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed Jan. 31, 1977, Ser. No. 763,783

Int. Cl.[2] B44D *1/42*; B29H *19/00*

U.S. Cl. 428—379 **8 Claims**

1. A process for utilizing reclaimed thermosetting crosslinkable polyethylene recovered from an extruder, said recovered polyethylene being fully compounded to permit re-extrusion to a final product, the steps comprising:

a. initially extruding said fully compounded polyethylene without adding additional crosslinking agents at a temperature generally sufficient to cause crosslinking of said polyethylene, said temperature being above about 170° F. and below about 480° F.;

b. recovering the hot polyethylene;

c. granulating the recovered polyethylene while still warm and before it has become substantially crosslinked;

d. cooling the granulated polyethylene to arrest further crosslinking;

e. grinding the cooled granules to a powder of about 30 mesh or less; and

f. regranulating the powder suitable for extrusion use.

4,123,585

POLYMERIC COMPOSITION COMPRISING A HALIDE POLYMER, AN ETHYLENE TERPOLYMER AND AN ALKYL ACRYLATE COPOLYMER

Walter J. Sparzak, Catonsville, and William C. Vesperman, Bel Air, both of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 17, 1978, Ser. No. 888,254

Int. Cl.[2] C08L *27/06, 27/08*

U.S. Cl. 428—379 **13 Claims**

1. A polymeric composition which comprises:

(1) a solid halide polymer selected from the group consisting of a vinyl halide polymer and a vinylidene halide polymer;

(2) a terpolymer comprising by weight (a) 40 to 80 percent ethylene, (b) 3 to 30 percent carbon monoxide and (c) 5 to 60 percent of one or more monomers copolymerizable therewith in order to produce a solid copolymer, wherein said (c) is selected from the group consisting of unsaturated mono- or dicarboxylic acids of 2 to 20 carbon atoms, esters of said unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids where the acid group has 1 to 8 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1 to 18 carbon atoms, acrylonitrile, methacrylonitrile, norbornene, alpha-olefins of 3 to 12 carbon atoms and vinyl aromatic compounds; and

(3) a blending agent mixture comprising (a') a mixed alkyl phthalate having dissimilar alkyl groups of 6 to 11 carbon atoms and (b') a copolymer of from about 5 to about 95 percent by weight of an alkyl acrylate wherein the alkyl radical contains from 1 to about 12 carbon atoms and from about 95 to about 5 percent by weight of a dissimilar alkyl acrylate wherein the alkyl radical contains from 3 to 24 carbon atoms, said mixed alkyl phthalate (a') being present in an amount by weight at least equal to the amount by weight of said copolymer (b').

7. An electrical conductor provided with an extrudable coating of a composition comprising:

(1) a solid halide polymer selected from the group consisting of a vinyl halide polymer and a vinylidene halide polymer;

(2) a terpolymer comprising by weight (a) 40 to 80 percent ethylene, (b) 3 to 30 percent carbon monoxide and (c) 5 to 60 percent of one or more monomers copolymerizable therewith in order to produce a solid copolymer, wherein said (c) is selected from the group consisting of unsaturated mono- or dicarboxylic acids of 2 to 20 carbon atoms, esters of said unsaturated mono- or dicarboxylic acids, vinyl esters of saturated carboxylic acids where the acid group has 1 to 18 carbon atoms, vinyl alkyl ethers wherein the alkyl group has 1 to 18 carbon atoms, acrylonitrile, methacrylonitrile, norbornene, alpha-olefins of 3 to 12 carbon atoms and vinyl aromatic compounds; and

(3) a blending agent mixture comprising (a') a mixed alkyl phthalate having dissimilar alkyl groups of 6 to 11 carbon atoms and (b') a copolymer of from about 5 to about 95 percent by weight of an alkyl acrylate wherein the alkyl radical contains from 1 to about 12 carbon atoms and from about 95 to about 5 percent by weight of a dissimilar alkyl acrylate wherein the alkyl radical contains from 3 to 24 carbon atoms, said mixed alkyl phthalate (a') being present in an amount by weight at least equal to the amount of said copolymer (b').

4,123,586

FLAME-RESISTANT COMPOSITION, AND ELECTRICAL PRODUCT THEREOF

Joseph E. Betts, Westport, Conn., and Fred F. Holub, Schenectady, N.Y., assignors to General Electric Company, New York, N.Y.

Continuation-in-part of Ser. No. 554,471, Mar. 3, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,857

Int. Cl.[2] D02G *3/00*; B32B *25/20*

U.S. Cl. 428—391 **7 Claims**

1. An electrical conductor comprising a metallic conductive

element having a flame-resistant, cross-link cured polyolefin insulation thereabout consisting essentially of the following, in the approximate relative parts by weight of:

Polyolefin	100
Decabromodiphenyl ether	15 - 50
Silicone gum	3 - 10
Organic lead salt	3 - 10
Antimony oxide	5 - 25
Fumed silica	3 - 10

4,123,587

METHOD OF MANUFACTURING A FINELY GRANULAR CONCENTRATE OF FIRE-RETARDING FOAM-FORMING SOLID ADDITION SUBSTANCES FOR PLASTICS, VARNISHES, COATING COMPOSITIONS, AND SIMILAR SUBSTRATES

Ludwig Wesch, Gorresstrasse 54, Heidelberg, Germany; Luis C. Roma, C/Montserrat 22, Sabadell, and Carlos F. Pellicer, C/Balmes 454 s/a, Barcelona, both of Spain

Filed Feb. 2, 1977, Ser. No. 764,847
Claims priority, application Spain, Feb. 3, 1976, 444.861
Int. Cl.[2] C08K *9/06;* B32B *31/00*
U.S. Cl. 428—407 18 Claims

1. A method of producing a fine granular concentrate of fire-retarding, foam-forming solids for addition to a host material including plastics, paints, coating compositions and the like which comprises,

providing particles of solid fire-retarding additives of particle size less than about 5 μm,

forming a mixture of said particles with a polymeric material wherein said particles are surrounded and coated by said polymeric material, said polymeric material being compatible with or the same as the host material to which the coated particles are subsequently added to confer fire-retarding and foam-forming properties thereto,

comminuting said polymeric-particle mixture to a granular product of less than about 50 μm,

and repeating the coating procedure at least one more time on said granular product by mixing said granular product with polymeric material,

drying and comminuting said granular-polymeric mixture to provide a granular concentrate having a size of less than about 50 μm with an outer layer of said polymeric material,

said polymeric material in at least the outer layer of said granular concentrate being characterized by being capable of splitting off nitrogen and/or water under pyrolitic conditions.

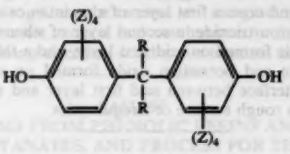
4,123,588

LAMINATES

Richard E. Molari, Jr., Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 586,630, Jun. 13, 1975, Pat. No. 4,027,072, which is a continuation-in-part of Ser. No. 369,663, Jun. 13, 1973, abandoned. This application Jan. 24, 1977, Ser. No. 761,876
Int. Cl.[2] B32B *9/00, 17/10, 27/36*
U.S. Cl. 428—412 8 Claims

1. A laminate of an acrylic polymer and other material selected from the group comprising solid resinous material, glass, wood, ceramics, metals and cermets and having as adhesive interlayer block polysiloxane-polycarbonate copolymer prepared by reacting (A) a halogen chain-stopped polydiorganosiloxane composed of from about 5 to 200 chemically combined diorganosiloxy units consisting essentially of dialkylsiloxy units which are connected to each other by silicon-oxygen-silicon linkages wherein each of the silicon atoms has two organo radicals attached through a carbon-silicon bond, and (B) a dihydric phenol having the formula



where Z is a member selected from the class consisting of hydrogen, lower alkyl radicals and halogen radicals and combinations thereof, and R is a member selected from the class consisting of hydrogen, hydrocarbon and halogenated hydrocarbon radicals, and phosgenating the purified reaction product until the resulting copolymer achieves a maximum intrinsic viscosity.

4,123,589

POLYURETHANES AND FOOD CASING MADE THEREFROM PARTICULARLY BY EXTRUSION AND STRETCHING

Rudi Korlatzki, Laudenbach, and Gunter Schuhmacher, Weinheim, both of Germany, assignors to Naturin-Werk Becker & Do., Weinheim, Germany

Filed Dec. 23, 1976, Ser. No. 753,694
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559318
Int. Cl.[2] C08G *18/42;* B32B *27/40;* A22C *13/00*
U.S. Cl. 428—425 24 Claims

1. A food casing comprising at least one layer of plastic material, such layer comprising a polyurethane elastomer exhibiting thermoplastic properties on processing, the polyurethane consisting essentially of base units derived from the reaction of

(a) at least one high molecular weight diol,

(b) at least one di-isocyanate, and

(c) at least one low molecular weight glycol as chain-extender, both the base units derived from both the high molecular weight diol and the di-isocyanate consisting essentially of linear C_6-aliphatic units, the equivalent ratio of high molecular diol to di-isocyanate base units being in the range of approximately 1:3.5 to 1:70, the quantity-weight ratio of said base units being in the range of from approximately 1:0.4 to 1:4.0, respectively, the equivalent ratio of the low molecular glycol to high molecular diol being from approximately 5:1 to 70:1, the chain extender comprising no more than approximately 50 mole-% of linear C_6-aliphatic units.

10. A food casing according to claim 1, in which at least one polyurethane layer has been co-extruded with at least one layer of material selected from the group consisting of polyurethane, polyvinylchloride, polyvinylidene chloride, polyamides, polyesters and polyacrylonitriles.

4,123,590

DRY WRITING BOARD POSSESSING ANTI-HALATION EFFECT AND PROCESS FOR PRODUCING THE SAME

Tetuya Hasegawa, and Akihiro Itishasi, both of Tokyo, Japan, assignors to Pilot Man-Nen-hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,955
Claims priority, application Japan, Dec. 28, 1974, 49-1165
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—450 6 Claims

1. A dry, enameled writing board possessing an anti-halation effect which comprises a steel plate, a ground coat on said steel plate, and a multi-layered fire-coated glaze on said ground coat, the multi-layered fire-coated glaze consisting essentially of 30 to 45% silicon oxide, 15 to 25% titanium oxide, 5 to 10% sodium oxide, 5 to 15% potassium oxide, 1 to 5% calcium oxide, 2 to 5% aluminum oxide and 10 to 20% boron trioxide, all percentages being by weight, said fire-coated glaze being

composed of the following layers, in an order beginning nearest said ground coat: a first layer of aluminum oxide, calcium oxide and boron trioxide, a second layer of silicon oxide and titanium oxide formed on said first layer, and a third layer of sodium oxide and potassium oxide formed on said second layer, the interface between said first layer and said second layer being a rough surface of irregularities.

4,123,591

PROCESS FOR FORMING AN OPTICAL BLACK SURFACE AND SURFACE FORMED THEREBY

Kenneth A. Karki, Lakewood, Colo., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Mar. 16, 1977, Ser. No. 778,031
Int. Cl.[2] G02B *1/10*
U.S. Cl. 428—454 **49 Claims**

1. A method of making an optically black surface having a low reflectance of electromagnetic radiation, especially in the solar spectrum, a relatively high heat resistance, and a relatively low amount of off-gassing, comprising the steps of

(a) Milling the following mixture of ingredients for up to about 25 minutes:

Ingredient	Amount (% by weight)
Alkali metal silicate	13–21
Black metal oxide pigment	17–27
Kaolin	0–5
Mica	0–3
Water	50–70

(b) Coating the surface to be rendered optically black

(1) by applying at least four coats of an inorganic composition comprising alkali metal silicate and metal oxide pigment composition, and

(2) by spraying at least the last two surface coatings, said last two surface coatings being said mixture, and

(c) Drying at least the coats prior to the last two coats, before applying the last two coats.

4,123,592

PROCESS FOR INCORPORATING FLAVORANT INTO CELLULOSIC SUBSTRATES AND PRODUCTS PRODUCED THEREBY

Norman B. Rainer, and Peter A. Wilson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,613
Int. Cl.[2] D21H *1/40, 5/22*
U.S. Cl. 428—532 **11 Claims**

1. A method for producing stable, flavored cellulose products comprising impregnating a dry cellulosic substrate with an essentially anhydrous solution comprising liquid ammonia and a solute of volatile flavorant and then evaporating essentially all of the impregnated ammonia from said substrate such that from about 0.2% to 2.0% of the flavorant based on the dry weight of the cellulose is physically encapsulated within the cellulose structure and is not released therefrom until the cellulose is contacted with either heat or moisture.

8. The product produced by the process of claim 1.

4,123,593

PAPER FOR SERVING CABLE CORES

Hans W. Dörr, Wiesbaden-Biebrich, and Ludwig Grosse, Taunusstein, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 16, 1974, Ser. No. 533,466
Claims priority, application Fed. Rep. of Germany, Dec. 19, 1973, 2363164
Int. Cl.[2] B32B *29/06*
U.S. Cl. 428—535 **1 Claim**

1. A paper for serving cable cores for the purpose of providing a swellable layer, comprising a paper base having a layer thereon of granules of a cross-linked cellulose ether which is inherently soluble in water, but is insoluble therein due to cross-linking, and which remains water-absorbent.

4,123,594

METALLIC COATED ARTICLE OF IMPROVED ENVIRONMENTAL RESISTANCE

David R. Chang, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 22, 1977, Ser. No. 835,542
Int. Cl.[2] B32B *15/18, 15/20*
U.S. Cl. 428—651 **7 Claims**

1. A metallic article comprising:

a substrate of a superalloy based on an element selected from the group consisting of Fe, Co and Ni, and

a graded coating diffused with said substrate to increase the hot corrosion resistance of the substrate, the graded coating consisting essentially of:

(i) an inner coating portion adjacent to and diffused with the substrate, and consisting essentially of, by weight, 10–50% Cr, up to 30% Al, up to 10% Hf, up to 30% of elements selected from the group consisting of Pt, Rh and Pd, up to 3% Y, with the balance at least one element selected from the group consisting of Fe, Co and Ni, and elements diffused from the substrate and the outer coating portion, and

(ii) an outer coating portion adjacent to and diffused with the inner coating portion, and consisting essentially of, by weight, 10–50% Al and 1–40% of elements selected from the group consisting of Hf, Pt, Rh and Pd, with the balance elements diffused from the inner coating portion.

4,123,595

METALLIC COATED ARTICLE

David R. Chang, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 22, 1977, Ser. No. 835,543
Int. Cl.[2] B32B *15/00, 15/18*
U.S. Cl. 428—667 **5 Claims**

1. A metallic article comprising:

a substrate of a superalloy based on an element selected from the group consisting of Fe, Co and Ni, and

a graded coating diffused with said substrate to increase the hot corrosion resistance of the substrate, the graded coating consisting essentially of:

(i) an inner coating portion adjacent to and diffused with the substrate, and consisting essentially of, by weight, 8–30% Al, 10–50% Cr, up to 10% Hf, up to 30% of elements selected from the group consisting of Pt, Rh and Pd, up to 3% Y, with the balance at least one element selected from the group consisting of Fe, Co and Ni, and elements diffused from the substrate and the outer coating portion and

(ii) an outer coating portion adjacent to and diffused with the inner coating portion, and consisting essentially of 5–50 weight percent of elements selected from the group consisting of Hf, Pt, Rh and Pd, with the balance elements diffused from the inner coating portion.

4,123,596

CATHODE STRUCTURE FOR SODIUM SULPHUR CELLS

Graham Robinson, Chester, England, assignor to Chloride Silent Power Limited, London, England

Filed Aug. 2, 1977, Ser. No. 821,107
Claims priority, application United Kingdom, Mar. 2, 1977, 4534/77
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—104 **11 Claims**

1. In a sodium sulphur cell having a cathodic region containing sulphur/polysulphides forming a cathodic reactant between a solid electrolyte and a cathode current collector, a porous packing in the cathodic region forming an electronic

conductor impregnated with the cathodic reactant, which packing is constituted at least partly of a porous metal structure

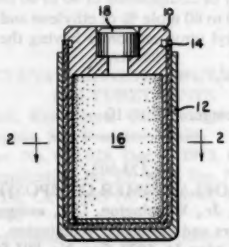
coated with graphite or carbon forming an electronically conductive protective coating over the metal.

4,123,597

THERMAL CELLS

John H. Zauner, Bloomington, and Lyle G. Waller, Clinton, both of Ill., assignors to National Union Electric Corporation, Bloomington, Ill.

Filed Oct. 19, 1953, Ser. No. 387,019
Int. Cl.[2] H01M *6/36*
U.S. Cl. 429—112 **10 Claims**



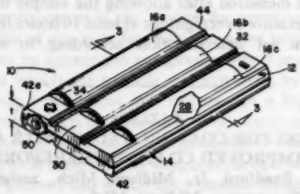
1. A thermal cell comprising a metal container, heat source material in said container, said container forming one electrode of said cell, dry electrolyte in contact with the outer surface of said container, and an outer metal shell contacting said electrolyte and separated thereby from said container and constituting another electrode of said cell.

4,123,598

BATTERY PACK AND CONTAINER

Ronald O. Hammel, Englewood, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Apr. 24, 1978, Ser. No. 899,036
Int. Cl.[2] H01M *6/42*
U.S. Cl. 429—159 **15 Claims**



1. A battery container for housing adjacent rows of interconnected unitary electrochemical cells comprising a pair of cofitting molded trays, at least one of said trays having an outer surface formed of a plurality of parallelized closely spaced elongate arches interconnected at adjoining base portions and defining within the container cylindrical chambers for receiving the cells, end surfaces extending generally transversely of and bridging together the arches or marginal extensions thereof of the outer surface, and notch means in the end surfaces for receiving electrical conductive terminal means.

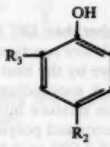
4,123,599

FOAMS FROM PHENOLIC RESINS AND ISOCYANATES, AND PROCESS FOR THE MANUFACTURE THEREOF

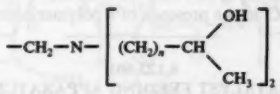
Karl-Heinz Hilterhaus, Georgsmarienhütte, and Franz G. Reuter, Lemforde, both of Fed. Rep. of Germany, assignors to Chemie-Anlagenbau Bischofsheim GmbH, Osnabruck; Reuter Technologie GmbH, Lemforde and Metallgesellschaft, Frankfurt am Main, all of, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,779
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1975, 2542900
Int. Cl.[2] C08G *18/14, 18/50;* C08K *3/22, 3/08*
U.S. Cl. 521—123 **5 Claims**

1. A process for the manufacture of a foam based on a phenolic resin having an OH number of from 300 to 600 and being an oxyalkylated mannich condensation product of the basic formula



where the radicals R_1, R_2 and R_3 are identical or different and denote



where *n* represents an integer from 1 to 6, said process comprising reacting said product with an organic diisocyanate or polyisocyanate or mixtures thereof, in the presence of a blowing agent consisting essentially of a gas produced by metal powder or a metal powder and a metal oxide powder, wherein the metal of the metal powder and the metal of the metal oxide powder are selected from the group consisting of aluminum, selenium, zinc, vanadium, manganese, cobalt, nickel, copper, chromium and mixtures thereof.

4,123,600

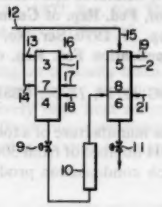
PROCESS FOR THE HIGH PRESSURE PRODUCTION OF POLYETHYLENE

Shinichiro Kita, Niihama; Fumihiko Hiki, Ichihara; Masayuki Shimizu, and Akira Kondou, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 4, 1977, Ser. No. 821,920
Claims priority, application Japan, Aug. 13, 1976, 51-97162
Int. Cl.[2] C08F *4/04, 4/34, 10/02*
U.S. Cl. 526—65 **7 Claims**

1. In a process for polymerizing ethylene under high temperature and high pressure conditions by using a battery of two or more autoclave reactors connected in series by piping provided with a heat exchanger, in which the reaction mixture withdrawn from the autoclave reactor of the preceding stage is cooled by said heat exchanger and the cooled reaction mixture is further introduced into the succeeding autoclave reactor, the improvement which comprises supplying a substantial portion of feed ethylene into the upper reaction zone of the preceding autoclave reactor having an upper reaction zone and a lower

reaction zone, while supplying the remaining portion of said feed ethylene into the upper reaction zone of the succeeding autoclave reactor having an upper reaction zone and a lower reaction zone, polymerizing the ethylene in the upper reaction zone of said preceding autoclave reactor under a pressure of 1,000 to 2,800 kg/cm^2 and at a temperature of 130° to 200° C. in the presence of a polymerization initiator, introducing the thus obtained reaction mixture into the upper or lower reaction zone of said preceding autoclave reactor and polymerizing said mixture therein at a temperature of 220° to 280° C. in the presence of a polymerization initiator, cooling the reaction mixture withdrawn from the bottom end of said preceeding



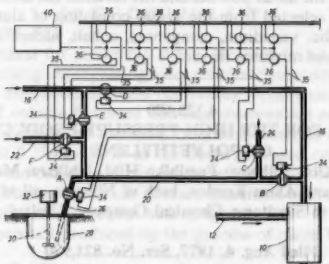
reactor to a temperature higher than 120° C. but lower than the reaction temperature in the lower reaction zone of said preceding reactor by 20° C. or more by the heat exchanger provided between said preceding and succeeding reactors, then forwarding the cooled reaction mixture into the upper reaction zone of said succeeding reactor and polymerizing said mixture therein under a pressure of 1,000 to 2,800 kg/cm^2 and at a temperature of 130° to 200° C. in the presence of a polymerization initiator, introducing the thus obtained reaction mixture into the lower reaction zone of said succeeding reactor and further polymerizing said mixture therein at a temperature of 220° to 280° C. in the presence of a polymerization initiator.

4,123,601

CATALYST FEEDING APPARATUS

Gene E. Kellum, and Jack W. Thompson, both of Orange, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Apr. 20, 1977, Ser. No. 789,051
Int. Cl.^{2} B01J *8/00*; C08F *2/00, 4/00*
U.S. Cl. 526—79 **4 Claims**



1. Apparatus for feeding controlled quantities of a slurry of catalyst solids in a liquid medium to a reactor in a controlled time sequence consisting essentially of:

a. a reactor,
b. a fluid line to feed a liquid to said reactor,
c. a bypass line which connects to two parts of said fluid line and constitutes loop in said fluid line,
d. a first valve in said fluid line intermediate of the loop ports,
e. a second valve positioned in said loop near its inlet port,
f. a third valve positioned in said loop near its outlet port,
g. a fourth valve positioned in said loop intermediate of said second and third valves to feed a liquid to said loop,
h. a fifth valve positioned in said loop intermediate of said second and third valves to vent fluid from said loop,
i. a liquid reservoir adapted to contain a slurry of catalyst solids in a liquid medium and
j. a feed line connecting said liquid reservoir to said loop and having a sixth valve therein.

4,123,602

TERPOLYMERS OF TETRAFLUOROETHYLENE, ETHYLENE AND PERFLUOROALKYL VINYL MONOMER AND PROCESS FOR PRODUCING THE SAME

Hiroshi Ukihashi, Tokyo; Masaaki Yamabe, Machida, and Haruhisa Miyake, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 689,526, May 24, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,894
Int. Cl.^{2} C08F *210/02, 214/18, 214/26*
U.S. Cl. 526—206 **34 Claims**

1. A terpolymer having a volumetric flow rate of 10 to 500 mm^3/sec. as determined at 300° C under a load of 30 kg/cm^2 containing mainly tetrafluoroethylene and ethylene which consists essentially of components of 40 to 60 mole % of tetrafluoroethylene, 40 to 60 mole % of ethylene and 0.1 to 10 mole % of perfluoroalkyl vinyl monomer having the formula

$$CH_2 = CH - C_nF_{2n+1}$$

wherein n is an integer of 2 to 10.

4,123,603

FLUOROELASTOMER COMPOSITION

Clare A. Stewart, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 31, 1977, Ser. No. 801,567
Int. Cl.^{2} C08F *214/22*
U.S. Cl. 526—254 **2 Claims**

1. An improved elastomeric terpolymer containing polymerized units of vinylidene fluoride, hexafluoropropene and tetrafluoroethylene wherein the improvement is characterized in that said vinylidene fluoride is present in the amount of 57–61 weight percent, said hexafluoropropene is present in the amount of 27–31 weight percent, said tetrafluoroethylene is present in the amount of 10–14 weight percent, and said terpolymer has a glass transition temperature of −24° C. or below and, when vulcanized, high compression set recovery as measured by a test from the group consisting of (1) less than 20% residual compression set measured within one hour after warming the sample to room temperature following compression set determination at 0° C. for 70 hours according to ASTM D-395, Method B, and (2) less than 10% residual compression set measured after allowing the sample to recover at room temperature overnight for at least 16 hours following the compression set determination according to said ASTM method.

4,123,604

PROCESS FOR COATING A SUBSTRATE AND AN IMPROVED COATING THEREFORE

Robert W. Sandford, Jr., Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 605,491, Aug. 18, 1975. This application Oct. 6, 1977, Ser. No. 839,876
Int. Cl.^{2} C08G *77/04*
U.S. Cl. 528—31 **4 Claims**

1. A composition comprising

(1) 100 parts by weight of a diorganopolysiloxane-based formulation which is heat curable to an elastomer by the

addition of methylhydrogenpolysiloxanes to silicon-bonded alkenyl groups,

(2) from 0.5 to 90 parts by weight of a toluene soluble copolymer of (a) $R_3SiO_{1/2}$ units, (b) $(CH_2{=}CH)R_2SiO_{1/2}$ units and (c) $SiO_{4/2}$ units, the ratio of said (a) and (b) units to (c) units being from 0.6:1 to 1.1:1 and the silicon bonded hydroxy content of (2) being no more than 0.7 weight percent based on the weight of (2), where R is a monovalent hydrocarbon radical of no more than 2 carbon atoms, and

(3) a catalyst comprising complexes of rhodium selected from the group consisting of (i) $RhX_3(SR'_2)_3$ and (ii) $Rh_2(CO)_4X_2$, wherein each X represents a halogen atom and each R' represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 8 inclusive carbon atoms or the R''$_3$SiQ- group in which Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 inclusive carbon atoms and R'' represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 8 inclusive carbon atoms or a $(CH_3)_3Si$- group, not more than one R'' per molecule being $(CH_3)_3Si$-, the entire composition being essentially free of solvents.

4,123,605

META-ISOCYANATOBENZYL ISOCYANATE-DERIVED POLYURETHANES

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 422,623, Dec. 7, 1973, Pat. No. 4,079,073. This application Jul. 11, 1977, Ser. No. 814,587

Int. Cl.[2] C08G *18/42, 18/48, 18/14*

U.S. Cl. 528—60 **5 Claims**

1. A polyurethane composition made by reacting meta-isocyanatobenzylisocyanate wih a polyfunctional alcohol having at least two hydroxyl groups and a molecular weight of at least 92, under conditions sufficient to obtain a material useful as a coating material, as a paint constituent, as a varnish substitute, or as a foam.

4,123,606

DEAGGLOMERATION PROCESS

Satish C. Malhotra, Parkersburg, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 21, 1977, Ser. No. 835,806

Int. Cl.[2] C08F *6/00*

U.S. Cl. 528—499 **4 Claims**

1. An improvement in the process for preparing agglomerated granules of non-melt-fabricable granular tetrafluoroethylene polymer by agitating in an agitation vessel particles of said polymer in which the particle size averages, by weight, between about 5 and about 200 microns, in a liquid medium selected from the group consisting of (a) water and (b) a two-phase mixture of water and an organic liquid which is soluble in water up to at most 15% by weight at the operating temperature of the process and which has a surface tension no greater than about 40 dynes/cm. at 25° C. and in which the organic liquid is present in an amount of 0.1 to 0.5 cc per gram of polymer, said agitation being carried out at a level and for a time sufficient to agglomerate the particles, followed by isolating said agglomerates, the improvement which comprises, after said agitation is carried out, removing agglomerates larger than a predetermined size and agitating the removed oversize agglomerates in an agitation vessel along with water at a level higher than the level used in the agglomeration and for a time sufficient to subdivide oversize agglomerates into a size smaller than said predetermined size, and recovering the subdivided agglomerates.

4,123,607

ALKYLATED DERIVATIVES OF ANTIBIOTIC BM123γ

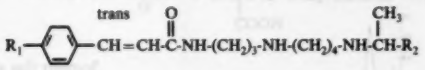
Joseph J. Hlavka, Tuxedo, and Panayota Bitha, Pomona, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 630,564, Nov. 10, 1975, Pat. No. 4,048,431, which is a continuation-in-part of Ser. No. 612,975, Sep. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 529,862, Dec. 5, 1974, abandoned. This application May 31, 1977, Ser. No. 801,898

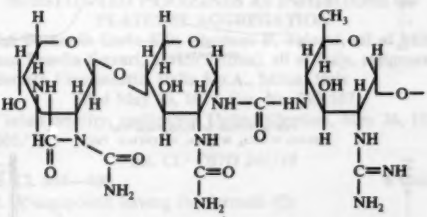
Int. Cl.[2] C07H *13/12*

U.S. Cl. 536—17 **31 Claims**

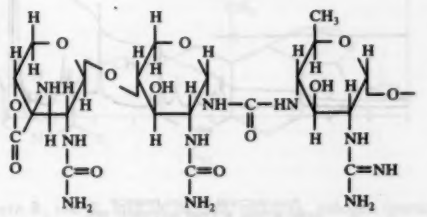
1. A compound selected from the group consisting of those of the formula:



wherein R_1 is a moiety selected from the group consisting of those of the formulae:



and



R_2 is selected from the group consisting of N,N-dipropylaminomethyl, styryl, 4-methylpenten-3-yl, 1,3-dimethylhexyl, β-indolylmethyl, cyclopenten-2-ylmethyl, (o-tolylcarbamoyl)methyl, methoxymethyl, cyclohexylmethyl, 2-(4-hydroxyphenyl)ethyl, n-nonyl, n-dodecyl, methoxyvinyl, 1-methyl-2-hydroxyethyl, N,N-diethylaminoethyl, carbethoxychloromethyl, 1-methyl-1-hydroxyethyl, (tert-butylcarbamoyl)methyl, dimethoxymethyl, phenoxymethyl, ethynyl, N,N-dimethylaminomethyl, N,N-diethylaminopropyl, cyclopropyl, 2,2-dimethoxy-ethyl, acetonyl, 4-chlorobenzyl, 3-chlorobenzyl, 2-chlorobenzyl, 1-acetamidoethyl, 3-pyridyl, 1-carbethoxyethyl, 1-hydroxyethyl, 1-methyl-2-hydroxyethyl, n-heptyl, 3-hydroxypropyl, n-octyl, 4-methylhexen-3-yl and 2-cyclopenten-1-ylmethyl; and the pharmacologically acceptable acid-addition salts thereof.

4,123,608

ANTIBIOTIC COMPOUND

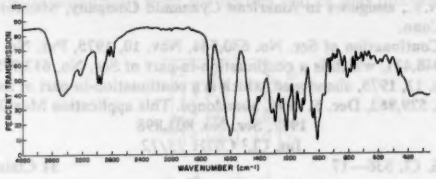
Donald E. Nettleton, Jr., Jordan; Terrence W. Doyle, Fayetteville, and William T. Bradner, Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 816,427, Jul. 18, 1977, abandoned. This application Jan. 25, 1978, Ser. No. 872,291

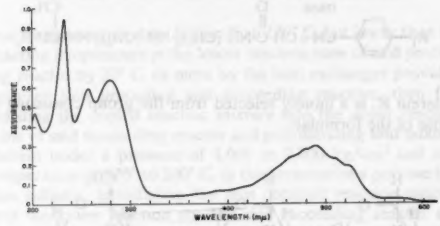
Int. Cl.[2] C07G *11/00*

U.S. Cl. 536—17 1 Claim

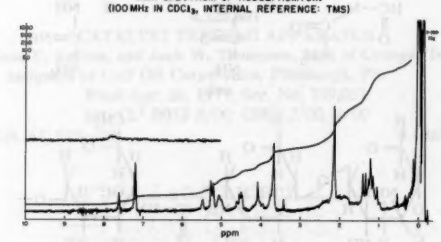
INFRARED ABSORPTION SPECTRUM OF RUDOLPHOMYCIN IN KBr



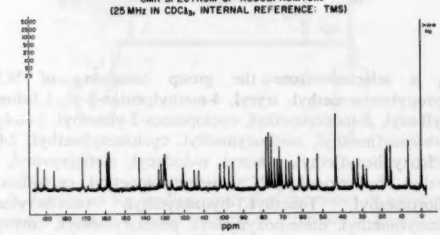
ULTRAVIOLET ABSORPTION SPECTRUM OF RUDOLPHOMYCIN IN METHANOL



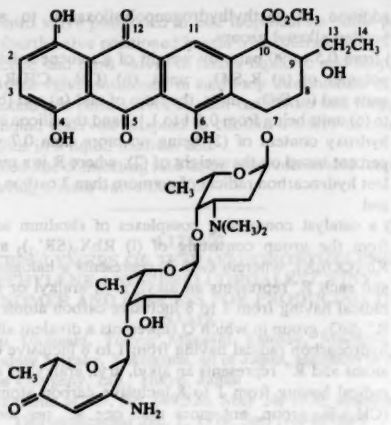
PMR SPECTRUM OF RUDOLPHOMYCIN
(100 MHz IN $CDCl_3$, INTERNAL REFERENCE: TMS)



^{13}CMR SPECTRUM OF RUDOLPHOMYCIN
(25 MHz IN $CDCl_3$, INTERNAL REFERENCE: TMS)



1. The anthracycline antibiotic, rudolphomycin, or a pharmaceutically acceptable salt thereof, said antibiotic being substantially free of substances co-produced therewith and having the structural formula:



4,123,609

PROCESS FOR THE PRODUCTION OF 9-(β-D-ARABINOFURANOSYL)ADENINE, 5'-PHOSPHATE

Walter E. Behnke, St. Clair Shores; William R. Marsh, Roseville, and Theodore H. Haskell, Ann Arbor, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 738,425, Nov. 3, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 831,703

Int. Cl.[2] C07H *17/00*

U.S. Cl. 536—27 15 Claims

1. In a process for the production of the ester product 9-(β-D-arabinofuranosyl)adenine, 5'-phosphate, comprising converting 9-(β-D-arabinofuranosyl)adenine to a 5'-monophosphorylated intermediate product in the presence of trialkyl phosphate solvent, and subjecting the reaction mixture to aqueous hydrolysis, the steps of isolating the ester product in crystalline form by means other than adsorption and elution comprising adjusting the pH of the aqueous hydrolysis mixture upward sufficiently to cause separation into aqueous and non-aqueous liquid phases, removing the trialkyl phosphate solvent from the aqueous mixture, maintaining the residual aqueous mixture at a pH at which the ester product is insoluble to cause said ester product to precipitate directly in crystalline form from the aqueous mixture, and isolating said crystalline ester product.

4,123,610

NUCLEIC ACID CROSSLINKING AGENT AND AFFINITY INACTIVATION OF NUCLEIC ACIDS THEREWITH

James E. Summerton, Denver, Colo., and Paul A. Bartlett, El Carrito, Calif., assignors to The United States Government, Washington, D.C.

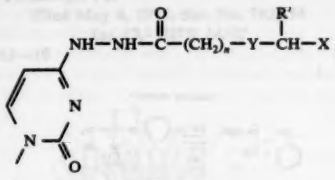
Filed Mar. 9, 1977, Ser. No. 775,800

Int. Cl.[2] C07H *19/20, 19/10, 21/02*

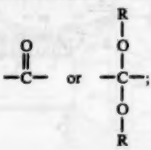
U.S. Cl. 536—28 12 Claims

5. An affinity inactivating agent for nucleic acids which is adapted for use in selectively inactivating a guanine residue-containing single-stranded polynucleotide target chain having a designated nucleotide sequence by base-pairing and covalently crosslinking therewith, said affinity inactivating agent comprising a derivatized cytosine residue-containing single-stranded polynucleotide carrier chain which has a nucleotide sequence complementary to said designated nucleotide sequence and which is capable of base-pairing with said target chain, at least one of the cytosine residues of said derivatized

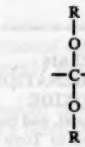
carrier chain being a C-4-substituted cytosine residue having the formula



wherein *n* is an integer of from 2 to 4; R′ is hydrogen or methyl; X is Cl or Br; Y is



when Y is



R is methyl or ethyl.

4,123,611

N-PROTECTED AMINO COMPOUNDS

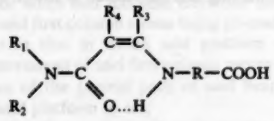
Toshiyasu Ishimaru, Suita; Yasutsugu Shimonishi, Nishinomiya; Hisayuki Sakurai, Osaka, and Minoru Hatanaka, Takatsuki, all of Japan, assignors to President of Osaka University, Japan

Continuation of Ser. No. 82,814, Oct. 21, 1970, abandoned. This application Jan. 6, 1975, Ser. No. 538,576

Int. Cl.² C07D *501/20*; A61K *31/545*

U.S. Cl. 542—421 **6 Claims**

1. An N-protected amino acid represented by the formula,



wherein R_1 and R_2 each is a lower alkyl group having 1 to 3 carbon atoms, or when taken together with the nitrogen atom attached thereto R_1 and R_2 jointly form a morpholine ring or a piperidine ring; R_3 is a lower alkyl group having 1 to 3 carbon atoms, R_4 is a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, or when taken together with the carbon atoms attached thereto R_3 and R_4 jointly form cyclopentenyl or cyclohexenyl, and R is an alkylene group or a group of the formula,

wherein R_5 is a hydrogen atom and R_6 is selected from the group consisting of methylthioethyl, phenyl and thienyl groups, and wherein R_5 and R_6 together represent a cyclopentyl or cyclohexyl group, or the alkali salts thereof.

4,123,612

7-(5-AMINO-5-CARBOXYVALERAMIDO)-3-(CARBAMOYOLOXYMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

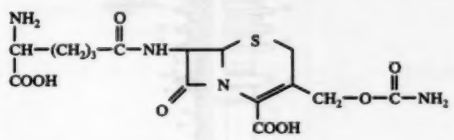
Marvin Gorman; Calvin E. Higgens, and Ramakrishnan Nagarajan, all of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 62,390, Aug. 10, 1970, abandoned, which is a continuation-in-part of Ser. No. 849,395, Aug. 12, 1969, abandoned. This application Apr. 23, 1974, Ser. No. 463,233

Int. Cl.² C07D *501/60*

U.S. Cl. 544—16 **3 Claims**

1. The compound of the formula



or a salt thereof.

4,123,613

SUBSTITUTED PYRAZINES AS INHIBITORS OF PLATELET AGGREGATION

Luigi Bernardi; Carlo Elli; Giovanni B. Falconi, all of Milan, and Rosella Ferrari, Sovico (Milan), all of Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

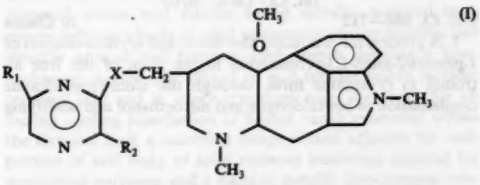
Filed May 23, 1977, Ser. No. 799,167

Claims priority, application United Kingdom, May 26, 1976, 21801/76

Int. Cl.² C07D *241/18*

U.S. Cl. 544—408 **6 Claims**

1. A compound having the formula (I):



(I)

where R_1 and R_2 may be methyl, methoxy, halogen (particularly chlorine, bromine or fluorine), or hydrogen, with the proviso that R_1 and R_2 cannot both be hydrogen, and

X may be S or NH.

4,123,614

NOVEL ASSAY REAGENTS

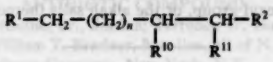
David H. Rammler, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 509,528, Sep. 26, 1974, abandoned, which is a division of Ser. No. 225,342, Feb. 10, 1972, Pat. No. 3,880,934. This application Oct. 18, 1976, Ser. No. 733,638

Int. Cl.² C07C *79/22*

U.S. Cl. 560—254 **3 Claims**

1. A reagent useful for enzyme measurements which is a compound selected from those represented by the following formula:



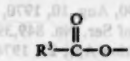
wherein,

R^1 is 4-nitrophenyloxy or 2,4-dinitrophenyloxy;

n is 1;

R^2 is hydrogen; and

R^{10} and R^{11} each is independently hydroxy or a carboxylic ester of the formula



wherein R^3 is alkyl of one to eighteen carbon atoms, provided that at least one of R^{10} and R^{11} is a carboxylic ester.

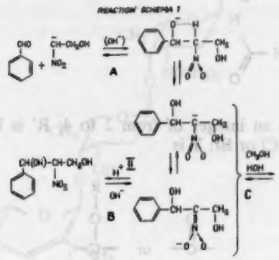
4,123,615

PROCESS FOR PREPARING THE THREO- AND ERYTHRO-ISOMERS OF 1-PHENYL-2-NITRO-1,3-PROPANEDIOL

László Lévai, and Gyula Mikite, both of Budapest, Hungary, assignors to Egyt Gyogyszervegyeszeti Gyar, Budapest, Hungary

Filed Feb. 23, 1977, Ser. No. 771,369
Claims priority, application Hungary, Feb. 25, 1976, EE 2407
Int. Cl.[2] C07C *76/02*
U.S. Cl. 568—712 **10 Claims**

1. A process for producing the threo- and erythro-isomers of 1-phenyl-2-nitro-1,3-propanediol in the form of the free nitrodiol in crystalline form, through the aldol-type alkaline condensation of benzaldehyde and nitroethanol and acidifying the reaction mixture, characterized in that the condensation is carried out in the presence of a catalytical amount of an alkaline hydroxide which is only a minor fraction of the stoichiometric amount.



4,123,616

PROCESS FOR HYDROGENATION OF ORGANIC PEROXIDE

Shunsuke Mabuchi; Kenji Tsuzuki, and Sadakatsu Kumoi, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan

Filed Jun. 15, 1977, Ser. No. 806,703
Claims priority, application Japan, Jul. 15, 1976, 51-83513
Int. Cl.[2] C07C *29/00*
U.S. Cl. 568—861 **11 Claims**

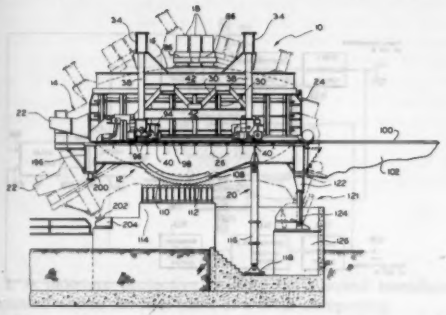
1. A process for hydrogenation of an organic peroxide to produce the corresponding mono- or polyhydric alcohol while substantially avoiding loss of catalyst activity for a long period of time which comprises feeding the organic peroxide into a suspension of more than 3 wt. % of a nickel catalyst in an inert solvent, at a rate of 0.05 to 10 g/hr. per 1 g of the nickel catalyst, at a reaction temperature of 140° to 200° C., under 10 to 300 Kg/cm^2 of hydrogen pressure, in a suspensoid process or a fluidized bed process; wherein said organic peroxide is fed into said suspension of the nickel catalyst heated at higher than 140° C. without contacting said suspension at lower than 140° C.

4,123,617

ELECTRIC ARC FURNACE

Peter J. Wynne, Pittsburgh, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed May 4, 1977, Ser. No. 793,754
Int. Cl.[2] F27B *14/02*
U.S. Cl. 13—10 11 Claims



1. An electric arc furnace comprising a platform pivotable about a generally horizontal axis,

a generally horizontally extending support floor adjacent said platform,

a furnace body mounted on said platform and having electrode means and a removable roof,

roof elevating means mounted on said platform and being constructed and arranged to elevate said roof and said electrode means and for swinging the same away from said furnace body and toward one side of said platform,

and support means disposed below said platform and on the side thereof toward which said roof and electrode means move,

said support means including pivotally mounted first column means, means for pivoting said first column means into and out of a substantially vertical position beneath said platform,

bearing means mounted below said platform and adapted to engage said first column means when the same is in its substantially vertical position whereby said platform is supported in general horizontal alignment with said support floor when said roof and electrode means are being swung, said first column means being pivotal in a direction opposite to that in which said platform tilts whereby tilting movement of said first column means will move the same out of the pivotal path of said bearing means to permit said platform to tilt,

said roof elevating means including gantry means having beam means extending horizontally above said roof means,

second column means supporting said beam means at one end and having roller means adjacent its lower end,

means at the opposite side of said furnace body for supporting said beam means for pivotal movement in a plane generally parallel to said platform, and means for pivoting said beam means whereby said roller means move off one side of said platform and onto an adjacent support floor at a point displaced horizontally from the pivot axis of said platform to swing said roof and electrode means away from said furnace body,

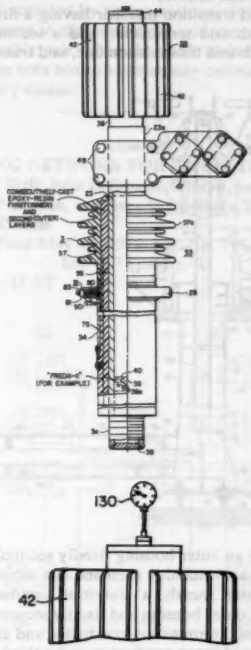
said first column means being disposed below the one side of said platform so that said pivotal movement of said platform is prevented as said roller means moves across said platform and onto the support floor.

4,123,618

VAPOR-COOLED TERMINAL-BUSHINGS FOR OIL-TYPE CIRCUIT-INTERRUPTERS

George B. Cushing, Penn Hills, and Richard E. Kothmann, Churchill Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 9, 1976, Ser. No. 694,105
Int. Cl.[2] H01B *17/26, 17/54;* H01H *33/68;* F28D *5/00*
U.S. Cl. 174—11 BH 4 Claims



3. A high amperage-current self-vapor-cooled terminal-bushing structure comprising, in combination: means defining a tubular sealed metallic terminal lead, volatile fluid means disposed within said tubular sealed metallic terminal lead; means defining a body of solid resinous insulating material cast directly around said terminal lead; means defining a heat-exchanger device (28) affixed to said tubular sealed metallic terminal lead and in vapor-communication therewith for effecting cooling liquefaction of heated vapor generated within the terminal lead; a mounting flange affixed adjacent the mid-portion of said body of solid resinous insulating material for supporting purposes; and a massive metallic line-terminal connector (47) affixed to the terminal lead intermediate the location of the said heat exchanger (28) and one end of the body of resinous insulating material for additional heat-dissipation purposes.

4,123,619

GAS TERMINATION SUPPORT SYSTEM

Philip C. Bolin, Westborough, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 1, 1977, Ser. No. 812,085
Int. Cl.[2] H02G *15/22, 15/24*
U.S. Cl. 174—19 7 Claims

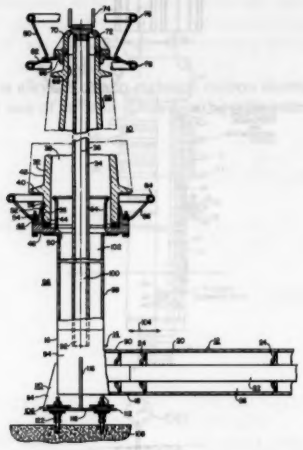
1. Gas-insulated electrical apparatus comprising:

a vertically disposed gas-insulated termination comprising a hollow insulating shell, a termination conductor disposed within said insulating shell, support means supporting said termination conductor within said insulating shell, and a first insulating gas disposed within said insulating shell and

electrically insulating said termination conductor from said insulating shell;

a generally horizontally disposed gas-insulated transmission line comprising an outer sheath, an inner conductor disposed within said outer sheath, support means insulatably supporting said inner conductor within said outer sheath, and a second insulating gas disposed within said outer sheath and electrically insulating said inner conductor from said outer sheath;

a gas-insulated transition member having a first end section aligned with said termination and a second end section aligned with said transmission line, said transition member



comprising an outer housing fixedly secured at a first end section to said insulating shell and at a second end section to said outer sheath, a transition conductor disposed within said outer housing and fixedly secured at a first end section to said termination conductor and at a second end section to said inner conductor, and a third insulating gas disposed within said outer housing and electrically insulating said transition conductor from said outer housing; and

means for supporting said termination comprising a base, a frame member fixedly secured to said outer housing and extending outwardly therefrom, and means for slidingly supporting said frame member on said base.

4,123,620

APPARATUS FOR CONTROLLING THE SOUND GENERATION IN THE LOUDSPEAKERS OF INTERCOMMUNICATING TELEPHONE SETS IN RESPONSE TO SPEECH SIGNALS FROM THE MICROPHONES OF SAID TELEPHONE SETS

Lars P. Karlsson, Masvägen 13, 183 51 Täby, Sweden

Filed Jun. 2, 1977, Ser. No. 802,803

Claims priority, application Sweden, Jun. 8, 1976, 7606399

Int. Cl.[2] H04M 9/10

U.S. Cl. 179—1 CN **4 Claims**

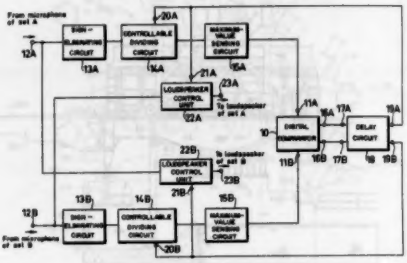
1. For use in a telephone system having a plurality of telephone sets, each telephone set including a microphone and a loudspeaker, an apparatus for controlling the generation of sound in the loudspeakers of intercommunicating telephone sets in response to pulse-code modulated speech signals from the microphones of said telephone sets comprising:

a plurality of controllable dividing circuits;

a plurality of maximum value sensing circuits, each sensing circuit including a storage function;

a plurality of control units, each one of said control units in series with a particular one of said loudspeakers; and

a digital comparator having a plurality of inputs, each input for receiving a speech signal in pulse-code modulated form from one of said microphones via one of said controllable dividing circuits in series with one of said maximum-value sensing circuits, said digital comparator having a number of outputs, from which the comparator delivers binary control signals to the dividing circuits to control said dividing circuits and to the control units to control said control units, said comparator being arranged to compare the received speech signals with each other and to deliver a binary control signal to the dividing



circuit through which the speech signal having the highest maximum value passes, said dividing circuit responding by dividing the speech signal passing therethrough with a lower factor than the remaining dividing circuits, said binary control signal further causing the control unit, associated with the loudspeaker of the telephone set having the microphone from which said maximum value speech signal emanates, to suppress the generation of sound in that loudspeaker.

4,123,621

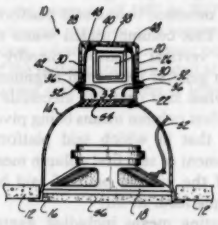
ACOUSTICAL SPEAKER DEVICE

Frank J. Walker, 3300 Lone Pine, West Bloomfield, Mich. 48033

Filed Dec. 5, 1977, Ser. No. 857,390

Int. Cl.[2] H04R 1/28

U.S. Cl. 179—1 E **14 Claims**



1. An acoustic speaker device comprising:

a parabolic shaped housing adapted to be recessed in a ceiling or the like, the parabolic housing being open opposite the concave end thereof and having an aperture formed through the concave end;

a collar coaxially surrounding the aperture and projecting outwardly of the housing from the convex side of the concave end of the housing;

an electrical transformer disposed in the collar,

means for removably mounting the transformer in the collar;

a cap coaxially disposed over the collar for closing the collar;

means for removably securing the cap to the collar; and,

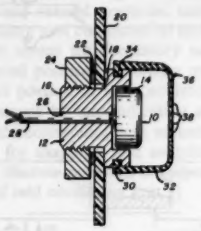
a loudspeaker device disposed within the housing proximate the opening of the housing and oriented to radiate sound waves outwardly of the housing through the opening.

4,123,622

PROTECTIVE COVER FOR SOUND TRANSDUCERS LOCATED IN FACE MASKS OF DIVERS

Norman C. MacLeod, Sunnyvale, Calif., assignor to Technology Development Corporation, Sunnyvale, Calif.

Filed Apr. 14, 1977, Ser. No. 787,342
Int. Cl.[2] H04R 1/02
U.S. Cl. 179—1 UW 5 Claims



1. A moisture protective housing for a sound transducer mounted within the face mask of a diver comprising:

a base member attachable to the interior of the face mask for holding said transducer and for making hermetically sealed electrical connection thereto;

a cover enveloping said transducer and sealingly engaging said base member; said cover having a deformable portion; and

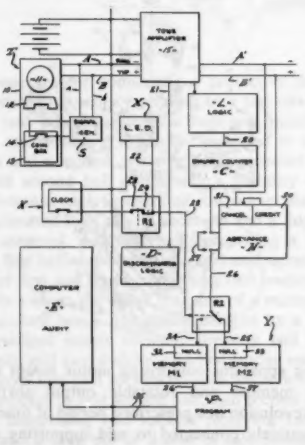
a plurality of pin prick type perforations in said deformable portion, the size and number of said perforations being selected so that said perforated portion becomes permeable only if and when the pressure differential across said deformable portion exceeds a preselected value.

4,123,623

PAY TELEPHONE ALARM AND AUDIT SYSTEM

Steve I. McElliott, 3934 Lyceum Ave., Los Angeles, Calif. 90066

Filed Oct. 22, 1976, Ser. No. 734,812
Int. Cl.[2] H04M 17/00
U.S. Cl. 179—6.3 R 25 Claims



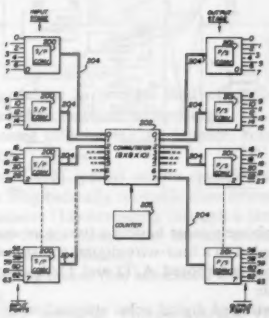
1. A money collection totaling system for loop start telephones having a coin tone generator and coin hopper passing coins into a coin vault with a vault switch operable by removal of a coin box therefrom, said tone generator being connected to a telephone cable pair to transmit tone bursts thereover according to the denomination of coins deposited through the hopper, and including; a distinguishable signal generator means connected to the telephone cable pair and controlled by said vault switch to be energized thereby and to transmit a distinguishable signal thereover when said vault switch is operated, a discriminator means connected to the telephone cable pair and responsive to said distinguishable signal to produce an operational signal, memory means to be connected to an extension of the said cable pair remote from the telephone to record the tone bursts as information, and relay means in circuit with and actuated by the operational signal from the discriminator means to disconnect the said memory means from said remote cable pair when the vault switch is operated by removal of the coin box to store money collection information in said memory means.

4,123,624

SWITCHING NETWORK FOR A PCM TDM SYSTEM

Real Gagnier, Hull; John B. Bourne, Ottawa, and John B. Terry, Carp, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 10, 1977, Ser. No. 795,615
Int. Cl.[2] H04J 3/00
U.S. Cl. 179—15 AT 11 Claims



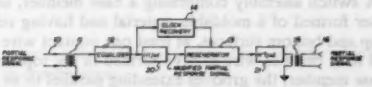
8. In a time division multiplex system comprising a switching network having an input stage and an output stage, each of the stages having a corresponding plurality of time switches, each of the time switches comprising a data memory for storing data words in parallel and an associated connection memory, a circuit for connecting the input stage to the output stage comprising, a commutator circuit for sequentially and periodically connecting each of the switches in the input stage to each of the switches in the output stage in a predetermined time invariant pattern such that each of the input stage time switches is connected to a respective one of the output stage time switches at any one time.

4,123,625

DIGITAL REGENERATOR HAVING IMPROVING NOISE IMMUNITY

Peter E. K. Chow, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 3, 1977, Ser. No. 848,301
Int. Cl.[2] H04B 3/36
U.S. Cl. 179—16 EA 14 Claims



9. In a digital repeater for regenerating a partial-response signal, subject to noise interference having a power density which varies with frequency, said repeater comprising:

a regenerator for regenerating said partial-response signal; the improvement comprising:

a first filter disposed between the input of the digital repeater and the regenerator to introduce intersymbol interference so as to transform the partial-response signal to a modified partial-response signal having not more than the same number of levels, the filter reducing the overall power of the noise interference; and

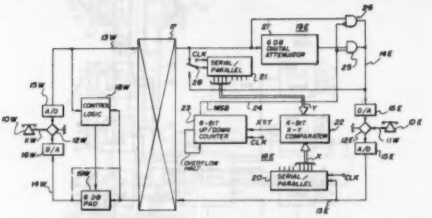
a second filter disposed between the regenerator and the output of the digital repeater having a transfer function which is the inverse of said first filter so as to derive a replica of said partial-response signal at the output thereof.

4,123,626

DIGITAL ECHO ATTENUATION CIRCUIT FOR A TELEPHONE SYSTEM

Ernst A. Munter, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 23, 1977, Ser. No. 854,118
Int. Cl.[2] H04B *3/20*
U.S. Cl. 179—170.2 **8 Claims**



1. In a telephone system having a two-wire analog transmission path coupled to a four-wire digital transmission path via a hybrid network interposed A/D and D/A converters in the four-wire path;

a voice controlled digital echo attenuation circuit comprising:

a comparator for comparing a sample of *n*-bits of each *m*-bit encoded word of tramsmit and receive pulse code modulated signals in the four-wire path to derive an output signal having a first or a second characteristic when the transmitted signal code is respectively not less than or less than the received signal code;

a L-bit up/down counter, having a maximum non-overflow store of $(2^L - 1)$ that is incremented or decremented by said output signal of the first or of the second characteristic respectively;

a digital attenuator responsive to the output of the up/down counter for attenuating the receive pulse code modulated signal in the four-wire path wherein said output is generated only when the store in the counter is at least $2^{(L-1)}$.

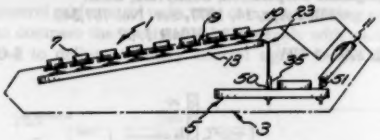
4,123,627

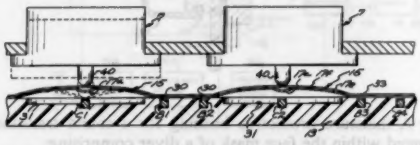
KEYBOARD APPARATUS

Henry J. Boulanger, Cumberland, R.I., and Salvatore P. Rizzo, Foxboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 6, 1976, Ser. No. 747,654
Int. Cl.[2] H01H *13/70, 9/00*
U.S. Cl. 200—5 A **17 Claims**

1. A switch assembly comprising a base member, said base member formed of a moldable material and having relatively flat top and bottom surfaces, at least one contact wire groove and at least one bus wire groove formed in the top surface of the base member, the grooves extending parallel to an axis, an electrically conductive contact wire disposed in each contact wire groove and an electrically conductive bus wire disposed in each bus wire groove, means to securely lock the wires in the grooves comprising portions of the base member displaced from areas contiguous to the grooves onto the wires, at least one switching station disposed along each contact wire, a flexible electrically conductive member overlying the top surface at each switching station, said member being permanently electrically connected to a respective bus wire and





being depressable into engagement with a contact wire to close a circuit between a bus wire and a contact wire;

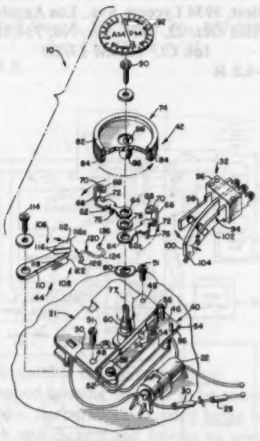
the wires having a diameter *d* and the grooves having a width no less than *d*.

4,123,628

TIMER SWITCH ASSEMBLY

Kenneth E. Kern, and James W. Richmond, both of Charlotte, N.C., assignors to General Time Corporation, Thomaston, Conn.

Filed Feb. 3, 1976, Ser. No. 654,949
Int. Cl.[2] H01H *43/10*
U.S. Cl. 200—38 FB **6 Claims**



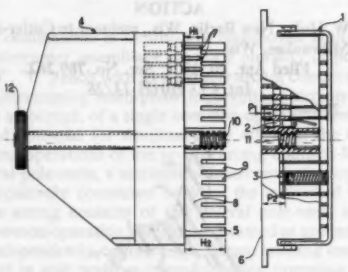
1. Timing apparatus comprising motor means including a supporting member and rotatable output shaft rotatable through a revolution in a prescribed period of time, switching means operatively connected to said supporting member of said motor means for alternating switching between two discrete positions for respectively operating electrical output devices, indicating means operatively connected to said output shaft for movement in unison with said output shaft, and for selective independent movement with respect to said output shaft in response to adjustment for adjustably setting the times within said prescribed period of time at which said switching means will be operated to effect such switching between the

electrical output devices, and actuating means operatively connected to said supporting member of said motor means, directly connected to said switching means and being operatively contacted by said indicating means for periodic movement between opposed first and second positions in response to displacement of said indicating means, said actuating means including biasing means for resiliently snapping and maintaining said switching means in either one of the two discrete positions whenever said actuating means is correspondingly in one of said first and second positions, said actuating means includes an oscillating arm connected to said supporting member of said motor means for oscillatory movement between said first and second positions, camming means directly connected to one end portion of said oscillatory arm and being positioned to be struck by said indicating means, said biasing means directly interconnecting said actuating means to said switching means for snapping said switching means to said either of the two discrete positions in response to said oscillatory movement of said oscillating arm.

4,123,629
CONNECTOR FOR TESTING AN ELECTRIC INSTALLATION

Maurice Chagnon, Villeurbanne, and Michel Lemery, Ste Foy les Lyon, both of France, assignors to Delle-Alsthom S.A., Villeurbanne, France

Filed Feb. 25, 1977, Ser. No. 772,202
Claims priority, application France, Feb. 26, 1975, 76 05368
Int. Cl.² H01R *13/70, 33/54*
U.S. Cl. 200—51 R **4 Claims**

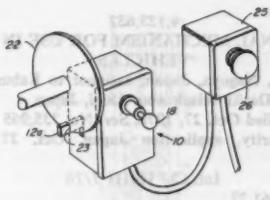


1. A connector for connecting a protective device of an electric installation under operation to a test device without removing said protective device from said installation, said connector comprising: a first half connected to said electric installation and a second, portable half connected to said test device, said second half comprising a plurality of identical rows of elements, each second half row comprising two electrically connected long pins, a short pin and a finger made of insulating material, said first half comprising a plurality of rows, said first half rows being of a first and second kind, said first kind of first half rows comprising two sockets receiving respectively a short pin and a long pin of a second half row, said two sockets being electrically bridged by a first bridge member, resilient means normally pressing said first bridge member onto said two sockets, said first bridge member being removed from said two sockets by said finger when said first half is connected to said second half, said second kind of first half rows comprising two sockets receiving respectively a short pin and a long pin of a row of said second half, said second kind of first half row two sockets being electrically bridged by a second bridge member, resilient means normally pressing said second bridge member onto said second kind of first half row two sockets, said second bridge member being at a different position with respect to said finger than said first bridge member of said first kind of rows, said second bridge member being removed from said second kind of first half row two sockets by a finger when said first half is connected to said second half, said second kind of rows comprising a third socket receiving a long pin of said second half, and means to in final sequence, electrically connect said third socket to a corresponding third socket of an adjacent row.

4,123,630
SAFETY DEVICE

Robert W. Mac Intyre, 103 Grove St., Concord; Edward J. Wysocki, 5 Radford Pl., Hyde Park; Philip Orifice, 28 Galen St., Waltham, and Ralph DiTillio, 15 Hazel Park, Everett, all of Mass.

Filed Nov. 17, 1976, Ser. No. 742,596
Int. Cl.² H01H *35/00;* **F16D** *9/00*
U.S. Cl. 200—52 R **2 Claims**

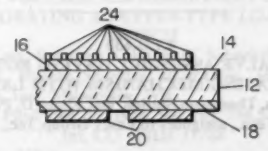


1. A safety device to prevent inadvertent operation of a control element in a machine comprising:
(a) a container (10) having an interior, transverse frame means (15);
(b) a solenoid (13) spaced within said container (10) and having a longitudinally movable core extension (12), said core extension (12) extending through a slot (15*a*) in said transverse frame means and having means cooperable with the control element:
(c) return spring means (14) associated with said core extension (12);
(d) vertically movable plunger means (17) extending through an orifice (15*a*, 16*a*) in said transverse frame means;
(e) return spring means 19 associated with said plunger means (17); and,
(f) switch means (25, 26) connected to said solenoid (13) and requiring constand pressure to keep said solenoid energized.

4,123,631
TOUCH SWITCH

Albert D. Lewis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 16, 1977, Ser. No. 769,260
Int. Cl.² H01H *9/26*
U.S. Cl. 200—52 R **7 Claims**



1. A touch actuated capacitance type switch which comprises, in combination:
a substrate plate, made of a dielectric material, having opposing faces;
a plurality of separated conductive touch pads formed on and adhered to one face of said plate, each of said pads being a relatively thin metallic area possessing little resis-

tance to abrasive wear and having a touch surface parallel to said plate;

a protective overcoat of a relatively abrasion resistant material overlying each of said touch pads in an open pattern which obscures no more than about seventy-percent of the total available area of said touch surface of said touch pads;

a plurality of separated and discrete conductive pads formed on and adhered to the other face of said substrate plate, said conductive pads being positioned in general alignment with said touch pads across the thickness of said substrate plate to thereby define capacitors; and

a conductor network intrconnecting said conductive pads in a predetermined logic configuration to thereby define a switch.

4,123,632

TURN SIGNAL MECHANISM FOR USE IN MOTOR VEHICLES

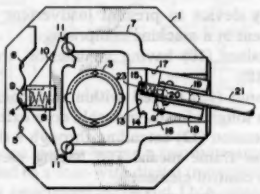
Toshiya Muto, Nagoya, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 27, 1976, Ser. No. 735,965

Claims priority, application Japan, Oct. 27, 1975, 50-146287[U]

Int. Cl.[2] H01H *3/16*

U.S. Cl. 200—61.27 **4 Claims**



1. A turn signal indicating mechanism comprising:

a housing;

a movable bracket movable to right and left turn and neutral positions provided in said housing;

an operating lever pivotally coupled to said movable bracket which is pivotable from a neutral position relative to said movable bracket to right and left lane change positions, said operating lever further causing said movable bracket to move to said right and left turn positions when said operating lever is pivoted beyond said right and left lane change positions; and

a turn signal switch operated by said lever such that a turn signal for a lane change is generated by pivoting the operating lever from said neutral position to a lane change position without moving said movable bracket and a turn signal for a right or left turn is generated by pivoting the operating lever beyond said lane change positions until the movable bracket is moved to either said right or left turn positions from said neutral position.

4,123,633

SWITCH-VALVE ASSEMBLY HAVING ROTATABLE OPERATING MECHANISM WITH LATCH

Joe M. Stevens, Thompson Station, and Elmer D. Porter, Franklin, both of Tenn., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 13, 1977, Ser. No. 787,195

Int. Cl.[2] H01H *9/06*

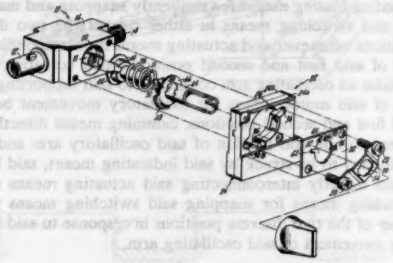
U.S. Cl. 200—61.86 **2 Claims**

1. A combination valve-switch assembly, which comprises:

a valve housing;

a rotatable operating stem extending from said valve housing;

a switch assembly including an insulating housing seated against said valve housing, an axial bore through said insulating housing aligned axially with said rotatable operating stem, switch blades enclosed in said housing, electrically insulated switch operating means on said housing extending radially into said bore for moving said switch blades into contact with one another;



an axially compressible, rotatable, operating mechanism axially aligned with said operating stem, and extending axially through said bore;

latch means for preventing rotatable movement of said operating mechanism; and

a cam mounted on said operating mechanism and arranged to cooperate with said switch operating means.

4,123,634

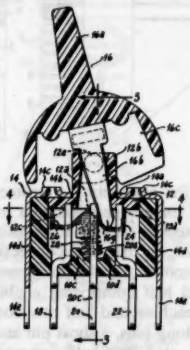
SNAP-ACTION SWITCH WITH CONTACT WIPING ACTION

Harold W. Hults, New Berlin, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 20, 1977, Ser. No. 789,262

Int. Cl.[2] H01H *13/28*

U.S. Cl. 200—67 A **7 Claims**



1. In a snap-action electric switch, the combination comprising:

a housing;

at least two stationary contacts spaced apart in said housing;

movable contact means in said housing including a member having an inverted V-shaped surface;

an operator mounted on said housing having an exterior portion, and a portion within said housing which engages with said inverted V-shaped surface of said member, and

spring means in said housing which engages with said movable contact means and urges said inverted V-shaped surface into engagement with the last mentioned portion of said operator,

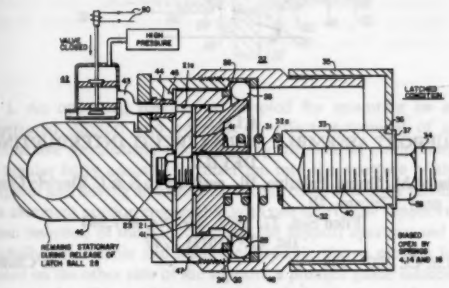
said operator being movable from one extreme position to cam said movable contact means to pivot inwardly of said housing and compress said spring means until said last mentioned portion of said operator rides over the apex of

said V-shaped surface of said member, whereupon said spring means moves said contact means with snap action upwardly and longitudinally in said housing to change circuit connections between said stationary contacts.

4,123,635
MULTI-POLE HIGH-VOLTAGE CIRCUIT-INTERRUPTER HAVING INDEPENDENT POLE TRIPPING WITH A SINGLE COMMON OPERATING MECHANISM

Joseph R. Rostron, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,796
Int. Cl.[2] H01H *33/28*
U.S. Cl. 200—148 F **6 Claims**


VALVE CLOSED
HIGH PRESSURE
LATCHED CONDITION
REMAINS STATIONARY DURING RELEASE OF LATCH BALL 59
BIASED OPEN BY SPRINGS 4,14 AND 16

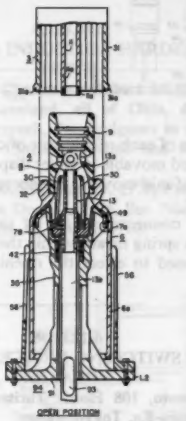
1. The combination in a multi-pole high-power high-voltage circuit-interrupter assemblage having a plurality of pole-units ("A", "B", "C") each with its separable arcing contacts, adaptable for interrupting multi-phase high-voltage circuits of considerable amperage, of a single common operating mechanism at ground potential for simultaneously effecting the opening and closing operations of the several arcing contacts for all of the several pole-units, a mechanical interconnecting operating linkage positively connected between the individual pairs of separable arcing contacts of the several pole-units and said single common operating mechanism situated at ground potential, an independently-operated ball-release latching means (22) interposed in said positive interconnecting operating linkage (20, 34, 46) for at least one of said pole-units, means responsive to a fault condition existing in said one pole-unit to release said independently-operated ball-release latching means (22) to thereby trip the said one affected faulted pole-unit open independently of the condition of said single common operating mechanism at ground potential.

4,123,636
DOUBLE-FLOW PUFFER-TYPE SINGLE-PRESSURE COMPRESSED-GAS CIRCUIT-INTERRUPTER

Charles F. Cromer, Penn Township, Allegheny County; Kue H. Yoon, Pittsburgh, and Willie B. Freeman, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,752
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **8 Claims**

1. A double-flow, puffer-type compressed-gas circuit-interrupter adaptable for high-current ratings including means defining a relatively-stationary contact structure, said relatively-stationary contact structure including a cluster of stationary main contact fingers (31) disposed in a generally cylindrical arrangement and a centrally-disposed stationary tubular arcing contact (11), means defining a cooperable movable contact structure (8), a movable operating-cylinder assembly (6) carrying said movable contact structure (8) and an insulating nozzle, said movable operating-cylinder assembly (6) having disposed thereon adjacent its forward end an annular relativelyheavy movable main contact (32) making cooperable engagement with said cluster of stationary main contact fingers (31) in the closed-circuit position of the circuit-interrupter, means defining a relatively-fixed piston member (7), said movable operating-cylinder assembly (6) slidable over said relatively-fixed piston member (7) during the opening operation, said movable contact assembly (8) additionally carrying a centrally-disposed movable tubular arc horn (13*a*) at its forward end which enters the stationary tubular arcing contact (11) in the closed-circuit position of the device, gas being compressed between the movable operating cylinder and the relatively-fixed piston to be forced out of the movable cylinder assembly through said hollow insulating nozzle (9) into engagement with the established arc drawn within the hollow movable nozzle (9) and between the stationary tubular contact (11) and the movable tubular arc horn (13*a*) during the opening operation of the



device, the movable insulating nozzle (9) making close valve-like engagement with the stationary tubular arcing contact (11) for an appreciable time following separation of the arcing contacts (11, 13*a*), double-flow gas exhausting through said separated arcing contacts (11, 13*a*) immediately following their separation during the opening operation of the circuit-interrupter, said cluster of main contact fingers (31) first parting contacting engagement with the main movable annular contact (32) of the movable operating cylinder assembly (6) during the opening operation, and then at a subsequent point in time the movable auxiliary fingers (30) parting contacting engagement with the relatively-stationary tubular arcing contact (11), so that final contacting separation occurs between the movable tubular arc horn (13*a*) and the relatively-stationary tubular arcing contact (11).

4,123,637
HIGH VOLTAGE AIR DISCONNECT SWITCH INCORPORATING A PUFFER-TYPE LOAD BREAK SWITCH

Donald L. Lott, Portland; Guenter G. Schockelt, Tigard, and Matthew L. Worrix, Sheridan, all of Oreg., assignors to Siemens-Allis, Inc., Milwaukee, Wis.

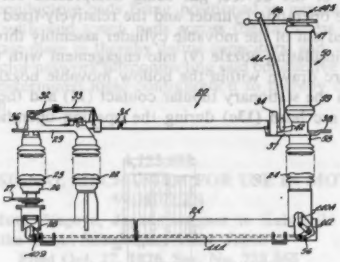
Filed Dec. 27, 1976, Ser. No. 754,574
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **4 Claims**

1. In a gas insulated circuit interrupter comprising an open-ended hollow cylindrical envelope of an electrical insulating material having metallic end caps for sealing the open ends of said envelope in a gas-tight manner, said envelope containing an arc extinguishing gas under pressure;

an internal open-ended cylindrical insulating housing coaxially disposed within said envelope, said housing extending between said envelope end caps;

a plurality of pairs of axially aligned contact members separable to draw an arc therebetween, one contact of each of said pairs of contacts is carried by a cone-configured member fixedly secured within said housing;

a stationary blast nozzle surrounding a contact of each pair of contacts, said nozzles are carried by said cone-configured members in coaxial relationship with the contact carried by the cone-configured member;



said other one of each of said pair of contacts are carried by an associated movable member disposed within said housing, some of said movable members serving as said piston means; and,

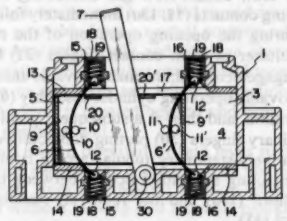
drive means connected to all of said movable members including a spring means within the housing and operable when released to effect the opening movement of said contacts.

4,123,638

HIGH SPEED SWITCHING DEVICE FOR SWITCH AND BREAKER

Motomu Miyamoto, 108 House Toritsudai, 12-21, 2-Chome, Nakane, Meguro-Ku, Tokyo, Japan

Filed Jun. 22, 1976, Ser. No. 698,631
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—153 G **3 Claims**



1. A high speed device for switching an electric switch from one position to another which comprises in combination

(a) a main housing chamber

(b) a runner in the form of a flattened hollow box slideably mounted within said housing chamber,

(c) at least one shaft integrally attached to said runner and extending laterally outwardly therefrom in engagement with said electric switch

(d) a lever extending completely through said runner and having one end pivotally attached to said chamber,

(e) two spaced apart plate springs extending through said runner,

(f) four spaced apart resilient mounting means in said main housing chamber for resiliently receiving and retaining the four ends of said two plate springs, the total force of the two resilient mounting means on each end of a plate spring being sufficient to cause the plate spring to take the shape of an arcuate bow,

(g) two plate spring engaging means extending through the interior of said runner, each spring engaging means serving to restrict an intermediate portion of a plate spring from moving laterally with respect to said runner,

(h) lever engaging means located on said runner, said lever being positioned so that movement of the lever from one position to another will move the runner laterally a sufficient distance that at least one of said plate spring engaging means will move its associated plate spring from an arcuate disposition to at least slightly beyond a straight up and down disposition,

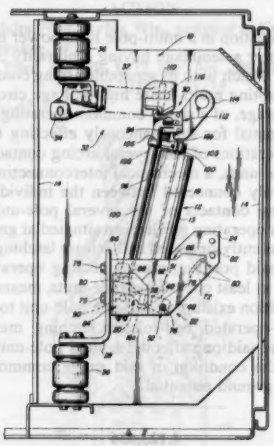
whereby movement of said lever from one position to another will move said shaft from one position to another and the natural resiliency of said plate springs will cause the runner and shaft to continue to move to the maximum extent in the direction initiated by the lever.

4,123,639

SUPPORT ASSEMBLY FOR A CIRCUIT INTERRUPTING DEVICE

David M. Evans, Palatine, Ill., assignor to S & C Electric Company, Chicago, Ill.

Filed Sep. 27, 1977, Ser. No. 837,243
Int. Cl.[2] H01H *1/42*
U.S. Cl. 200—254 **25 Claims**



1. An improved support assembly for a circuit-interrupting device having first and second end fittings on respective ends thereof, the end fittings defining the major axis of the device and being engageable with and disengageable from respective first and second mountings spaced apart in the assembly in insulated relation; a hookstick held by a human operator being selectively attachable to the first end fitting for manipulating the device to engage and disengage the end fittings and their respective mountings; wherein the improvement comprises:

first means for permitting slideable engagement and disengagement of the second mounting and the second end fitting in only one orientation of the second end fitting;

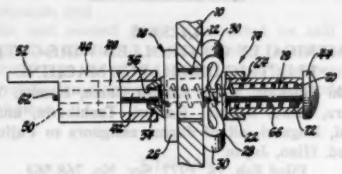
second means for permitting rotation of the second end fitting in the second mounting after slideable engagement therebetween to rotate the device about the second mounting; and

third means for supporting the device to position the second end fitting in the one orientation.

4,123,640
PUSH BUTTON TYPE SWITCH HAVING DEFORMABLE HOUSING SLEEVE FOR PERMANENT ATTACHMENT TO CONDUCTIVE PANEL

David B. Ballantyne, Southfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 690,509, May 27, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 862,151
Int. Cl.[2] H01H 13/02; G12B 9/00
U.S. Cl. 200—296 5 Claims

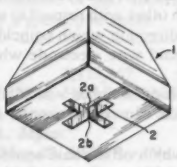


1. An operating mechanism adapted for mounting on an apertured support and operable to effect movement of an actuatable mechanism, said operating mechanism comprising: a tubular body adapted for insertion into the aperture of the support and having an axially extending bore, said body having an abutment portion engageable with one side of the support to limit insertion of the body through the support aperture and a radially expandable and axially collapsible sleeve portion located on the other side of the support, a plunger guide member supported within said bore of said tubular body, a plunger member extending through said guide member, one of said members including a head portion engageable with the end of said sleeve portion of the tubular body opposite the abutment means, means on the other end of said one member for engagement by a tool to move said one member relative to said tubular body and engage said head portion with said end of said body sleeve portion to axially collapse and radially expand said sleeve portion against said opposite side of said support and thereby attach said tubular body to said support, resilient means biasing said plunger member outwardly of said tubular body to an engageable position, stop means locating the plunger member against the bias of the spring means in said engageable position and means operatively connecting the plunger member with the actuatable mechanism.

4,123,641
PUSHBUTTON SWITCH

Taneo Murata, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Feb. 16, 1977, Ser. No. 769,055
Claims priority, application Japan, Feb. 27, 1976, 51-22911[U]
Int. Cl.[2] H01H 3/12
U.S. Cl. 200—340 3 Claims



1. In a pushbutton switch including a pushbutton formed of a synthetic resin material and having a recess, and a lever having an attachment portion for fitting into said recess, the improvement comprising:

said recess being substantially cross-shaped,

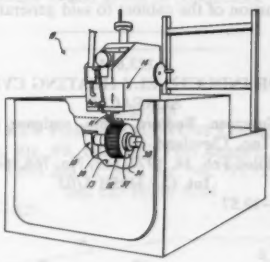
said attachment portion being substantially crossshaped in cross section and complementary with said recess, and

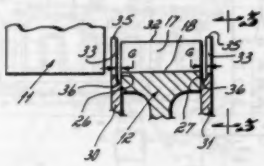
integral projections extending outwardly from the inner corners of said attachment portion to thrust into the wall of said recess, said lever being formed of a synthetic resin material relatively harder and relatively smaller in creep contraction rate than the material of said pushbutton, whereby over extended periods of use, said projections will be continually thrust into the wall of said recess.

4,123,642
APPARATUS FOR INDUCTION HARDENING GEAR TEETH

Howard W. Dammel, Cincinnati; Robert M. Frantz, Milford; James H. Luke, Loveland, all of Ohio, and William G. Skrzypczyk, Harborcreek, Pa., assignors to Cincinnati Steel Treating Company, Cincinnati, Ohio and General Electric Company, Erie, Pa.

Division of Ser. No. 608,630, Aug. 28, 1975, Pat. No. 4,026,732.
This application Dec. 13, 1976, Ser. No. 749,905
Int. Cl.[2] H05B 5/08
U.S. Cl. 219—10.59 5 Claims





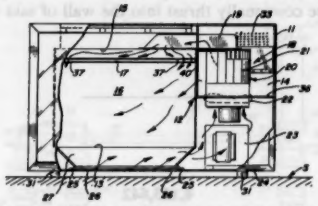
1. In combination, a machine for induction hardening oppositely facing working surfaces of adjacent teeth of a gear and a template for use with said machine, said machine including an electrical current intensifier movable between adjacent teeth of a gear while electrical current is flowing in said intensifier so that an electrical current is induced to flow through the opposed working surfaces of the teeth to effect heating of said working surfaces, said template having at least a peripheral portion in close proximity to but spaced from one side of the gear teeth, said template being in the form of a plate made from a low electrical resistance material, said plate having a peripheral contour similar to the peripheral contour of the gear teeth and having teeth formed thereon, the sides and roots of said teeth of said plate being undersized and spaced inwardly from the sides and roots of said gear teeth when said template is positioned for induction hardening said working surfaces of said gear teeth.

4,123,643

AIR CIRCULATION SYSTEM FOR MICROWAVE OVEN

Harry D. Burke, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 31, 1977, Ser. No. 801,834
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 R **20 Claims**



1. In a microwave oven having a cabinet defining a front opening, wall means within the cabinet dividing the interior of the cabinet into a oven space accessible through said cabinet front opening and a generating space, electrically operated generator means in said generating space for generating microwave energy, and waveguide means for conducting the microwave energy from the generating means to said oven cavity, improved air flow means comprising

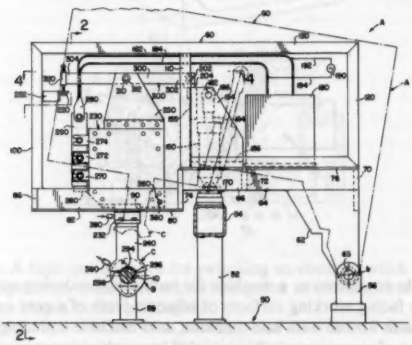
a bottom wall portion of said cabinet cooperating with said wall means to define means for conducting ambient air into said cabinet under said oven space and forwardly and rearwardly therefrom to pass through a front portion and a rear portion of the cabinet to said generating space.

4,123,644

DEVICE FOR INDUCTIVELY HEATING CYLINDRICAL SURFACES

Phillips N. Sorensen, Bedford, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Feb. 14, 1977, Ser. No. 768,164
Int. Cl.[2] H05B 5/02
U.S. Cl. 219—10.57 **14 Claims**



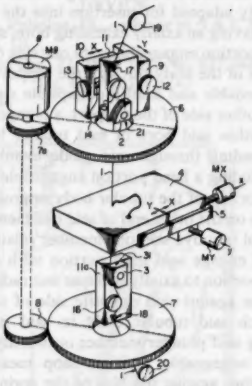
1. A device for inductively heating at least two cylindrical metal surfaces on an elongated workpiece having a central axis, said surfaces being generally concentric with said axis, said device comprising: an inductor for each surface and each inductor having a generally cylindrical coupling surface matching one of said metal surfaces; support means for carrying said inductors; means for moving said support means between a first position with said inductors spaced substantially from said cylindrical metal surfaces and a second fixed position with said inductors in their heating positions; stop means for supporting said support means in said second fixed position; an intermediate frame means for mounting each of said inductors onto said support means; each of said intermediate frame means comprising a first link extending generally horizontally over said workpiece axis and having first and second ends and an intermediate portion, means for mounting said link on said support means at said first end for pivotal movement toward and away from said workpiece and about an axis generally parallel to said central axis, a second link, means for pivotally mounting said second link on said intermediate portion of said first link for oscillation generally transverse to said workpiece axis and about an axis above and generally parallel to said central axis, means for mounting one of said inductors on said second link; and, means for selectively energizing said inductors.

4,123,645

NUMERICALLY CONTROLLED WIRE-CUTTING ELECTRIC DISCHARGE MACHINE

Hiromichi Shichida, Hino; Gotaro Gamo, Komae; Yoshiyuki Nomura, Hino; Kiyoshi Hattori, Tachikawa, and Yutaka Koiwai, Koganei, all of Japan, assignors to Fujitsu Fanuc Limited, Hino, Japan

Filed Feb. 14, 1977, Ser. No. 768,562
Claims priority, application Japan, Feb. 25, 1976, 51/19548
Int. Cl.[2] B23P 1/08
U.S. Cl. 219—69 W **7 Claims**



1. A numerically controlled wire-cutting electric discharge machine using a wire electrode comprising:

a numerical control apparatus sending out, at least a first, a second and a third command signal for at least three control axes;

a workpiece supporting means for supporting a workpiece;

a first motor means which moves said workpiece in a direction along an axis in a plane which is perpendicular to a predetermined axis;

a second motor means which moves said workpiece in another direction along another axis in said plane;

a pair of V type slot guides including a first guide and a second guide, said first and second guides being arranged opposed to each other with respect to said workpiece so as to stretch, in a direction which coincides with said predetermined axis, said wire electrode which passes through said workpiece;

a rotatable supporting member which supports said second guide and which can rotate around said predetermined axis;

an offset means which offsets said second guide in a predetermined direction in said plane which is perpendicular with said predetermined axis, so that the position of said wire electrode at said first guide coincides with said predetermined axis and the position of said wire electrode at said second guide is offset a predetermined amount from said predetermined axis;

a third motor means coupled to said rotatable supporting

means for rotating said second guide around said predetermined axis;

said numerical control apparatus supplies first and second signals to said first and second motor means, respectively, and said wire electrode moves relatively with respect to said workpiece in the plane which is perpendicular to said predetermined axis, and said numerical apparatus supplies said third signal to said third motor means and rotates said rotatable supporting means so that the surface which is determined by said predetermined axis and said wire electrode which is offset is perpendicular with respect to a relative movement between said wire electrode and said workpiece, and

wherein said second guide is mounted on said rotatable supporting member in such a manner that the center line of the V type slot of said second guide is perpendicular to the relative motion between said wire electrode and said workpiece.

4,123,646

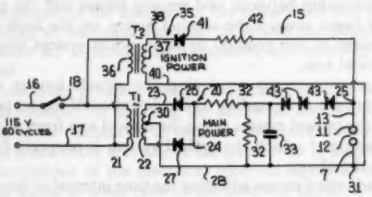
ARC WELDING SYSTEM

Henry J. Keinanen, Hickory Hills, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Continuation of Ser. No. 436,954, Jan. 28, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,741

Int. Cl.[2] B23K *9/06*

U.S. Cl. 219—137 R **12 Claims**



1. A method of arc welding a material in the absence of a protective agent, said method comprising the steps of:

(a) providing a welding electrode and a workpiece comprising a pair of electrodes defining a spark gap therebetween;

(b) repetitively applying to said pair of electrodes at a given cyclic rate and during alternate half cycles thereof, a high-voltage pulse of greater voltage than required for welding so as to produce across said gap, at a given instant during each of said alternate half cycles, an over-voltage of such magnitude as to create an ionized channel between said pair of electrodes; and

(c) applying to said pair of electrodes, at said given cyclic rate and at said given instant within each of said alternate half cycles, a high current welding current impulse of such magnitude as to effect welding of said material and of such impulse duration as to produce a shock wave propagating across said gap, whereby a substantially vacuum condition is created and maintained within said gap so as to minimize oxidation of said material during welding in the absence of a protective agent.

4,123,647

THERMAL HEAD APPARATUS

Fujio Oda, Ashiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 23, 1977, Ser. No. 799,297

Claims priority, application Japan, May 31, 1976, 51/63796; Aug. 18, 1976, 51/99132

Int. Cl.[2] H05B *1/00*

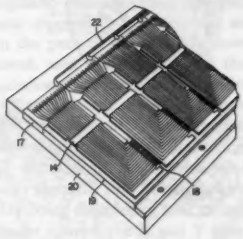
U.S. Cl. 219—216 **3 Claims**

1. A thermal head apparatus comprising

a support,

a heating block having an electrically and thermally insulative substrate located on said support and a plurality of heating elements disposed on said electrically and thermally insulative substrate along a straight line, said plurality of heating elements being divided into a plurality of groups having a common connection for each group,

a plurality of diode groups corresponding to said plurality of heating element groups, said plurality of diode groups including a plurality of diodes of identical polarity arranged along a straight line,



an insulating substrate located on said support and having a group of conductors thereon for matrix-wiring said heating elements through said diode groups, and

a film carrier provided with conductors for connecting said heating element block to the terminals on one side of said diode groups and the terminals on the other side of said diode groups to said group of conductors.

4,123,648

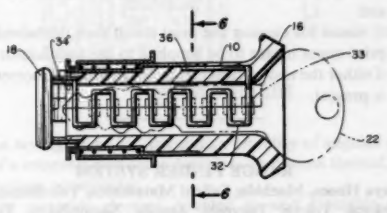
KEY FOR DEFROSTING LOCKS

Bob J. Clark, Rte. #5, Box 2054, Port Angeles, Wash. 98362

Filed Jan. 7, 1977, Ser. No. 757,717

Int. Cl.[2] H05B *3/06*

U.S. Cl. 219—521 **6 Claims**



1. A device for heating a key to defrost frozen locks, comprised of:

a plug formed of electrical insulating material and adapted to fit a standard automobile cigarette lighter socket;

an electrical heating coil comprising an electrical cigarette lighter heating element on the end of said plug;

energizing means for energizing said heating coil when said plug is fully inserted in said cigarette lighter socket;

a centrally located slot in said plug for receiving the blade of a key;

heat transfer means for transferring heat from said electrical heating coil to said slot when said electrical heating coil is energized;

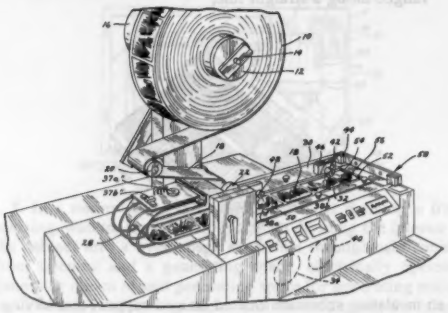
said heat transferring means comprising a high heat conductivity material substantially surrounding said slot so that heat from said energized coil is transferred to a key inserted in said slot whereby said device functions as a dual-purpose key heater and cigarette lighter.

4,123,649

PRINT AND ORDER TOTALIZER FOR AUTOMATIC PHOTOGRAPHIC PAPER CUTTER

Gerald R. Strunc, Maple Grove, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sep. 29, 1977, Ser. No. 838,065
Int. Cl.[2] G06M *3/06*; G07C *3/10*
U.S. Cl. 235—92 PD **4 Claims**



1. In a photographic print cutter system in which photogrpahic prints from a plurality of customer orders are cut from a strip of photographic paper, the improvement comprising:

knife means;

knife actuating means for actuating the knife means to cut a photographic print from the strip;

print count means for incrementing a print count for an order each time the knife actuating means actuates the knife means;

end-of-order means for providing an end-of-order signal indicative of the end of a customer order;

accumulator means for holding a count;

display means for displaying the count held in the accumulator means;

means for producing a packer/sorter signal indicating that an automatic print packing or sorting device is being used in conjunction with the photographic print cutter system; and

first means for causing the print count then contained in the print count means to be supplied to the accululator means if either the end-of-order signal or the packer/sorter signal is present.

4,123,650

RANGE FINDER SYSTEM

Kazuya Hosoe, Machida; Selichi Matsumoto, Yokohama; Hideo Yokota, Tokyo; Tsuyoshi Asaeda, Sagamihara; Tadahide Fukushima, Tokyo; Tamotsu Shingu, Kamakura; Shigeru Hashimoto, Yokohama, and Tomonori Iwashita, Chofu, all of Japan

Continuation of Ser. No. 552,320, Feb. 24, 1975, abandoned. This application Dec. 28, 1976, Ser. No. 755,006
Claims priority, application Japan, Feb. 26, 1974, 49-23088
Int. Cl.[2] G01J *1/20*; G03B *7/08*
U.S. Cl. 250—201 **39 Claims**

1. A system for setting an imaging optical system along an optical axis so as to adjust the focus of the optical system to an object, comprising:

projecting means for projecting a beam of radiant energy toward said object,

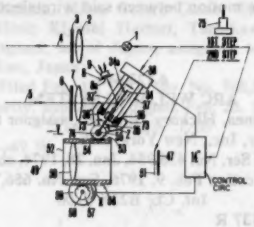
beam receiving optical means offset from said projecting means for receiving the beam reflected by the object at an angle depending upon the distance to the object from the projecting means and for forming a beam path depending upon the angle,

sensing means positioned in the path of the beam from the receiving optical means for sensing the reflected beam and producing an electrical signal in response thereto,

oscillating means for cyclically varying the mutual relationship between the sensing means and the path of the beam toward the sensing means and for intermittently diverting the reflected beam from the sensing means and directing it toward the sensing means so that the sensing means produces intermittent signals during each cycle of the oscillating means at a time interval responsive to the distance to the object from the projecting means,

reference signal generating means for generating reference signals at a predetermined time interval, and

adjusting means operatively coupled to said imaging optical system for substantially continuously varying the mutual



relationship between said sensing means and the path of the beam toward the sensing means on the basis of the change of the position of said optical system along the optical axis,

said sensing means producing the signals having a time interval corresponding to the deviation of the set position of the optical system along the optical axis from a focused position at which the optical system is properly focused on the object,

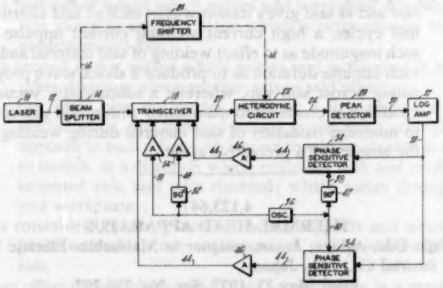
said adjusting means adjusting the time interval of the output signals of the sensing means until the time interval of the output signals of the sensing means has a predetermined relationship to the time interval of the reference signals generated by the reference signal generating means.

4,123,651

APPARATUS AND METHOD FOR SPECKLE TRACKING

Robert J. Mongeon, East Longmeadow, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 13, 1977, Ser. No. 815,611
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **17 Claims**



1. A system for tracking a target utilizing optical speckle produced by the interaction of a beam of electromagnetic radiation with a surface of the target to improve the signal to noise ratio of a received signal comprising:

means for providing a beam of coherent electromagnetic radiation;

means for separating the beam into a reference beam and a transmitted beam;

a transceiver having a telescopic system with an aperture for directing the transmitted beam to a target and for collecting a beam reflected from the target to provide a received beam including,

means for directing the transmitted beam to the telescopic system and for directing the received beam to a heterodyne circuit wherein the transmitted and received beam have a common optical path within the transceiver, and

means for dithering the means for directing the transmitted and received beams to impress an identical conical scan on the transmitted and received beams;

a heterodyne circuit capable of heterodyning the received beam with the reference beam to provide an electrical received signal proportional to the intensity of the received beam, the conically scanned speckle within the received beam traverse about the geometric center of the reference beam generating fluctuations in the electrical received signal having amplitude and phase characteristics proportional to the position of the speckle within the aperture of the transceiver;

detection means for processing the fluctuations of the electrical received signal to produce an output signal;

a phase sensitive detector responsive to the output signal;

means for providing an electrical signal to the phase sensitive detector to provide a forcing function for processing the output signal to obtain a two axis discriminate having error signals proportional to the position of a speckle maximum in the aperture of the transceiver and for providing an electrical signal to the means for dithering the means for directing the transmitted and received beams; and

a transceiver pointing control responsive to the two axis discriminate for directing the azimuthal and zenith pointing of the transceiver to maintain the speckle maximum in the plane of the aperture of the transceiver to minimize the fluctuations of the electrical received signal to improve the signal to noise ratio of the received signal.

4,123,652
APPARATUS FOR READING A RADIATION-REFLECTING RECORD CARRIER

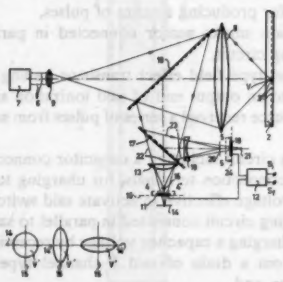
Gijsbertus Bouwhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,563

Claims priority, application Netherlands, Mar. 22, 1977, 7703077

Int. Cl.[2] G01J *1/36*

U.S. Cl. 250—204 **3 Claims**



1. Apparatus for reading a radiation-reflecting record carrier on which information is stored in an optically readable information structure arranged in tracks, comprising a radiation source means for producing a read beam of radiation, an objective system means for focussing the read beam on the record carrier, whereby the record carrier modulates said read beam, a radiation-sensitive information detection system in the path of the modulated read beam for converting the modulated read beam into an electrical signal, means for directing the modulated radiation beam from the record carrier along a path separated from the read beam provided by the radiation source means, a beam splitter means in the separate path for dividing the modulated beam from the record carrier into two sub-beams of substantially equal intensity, a first astigmatic element in the path of one of the sub-beams, a second astigmatic element in the path of the other of said sub-beams, the astigmatism of the first astigmatic element being opposed to that of the second astigmatic element, a first detector assembly of four sub-detectors in the path of the first sub-beam from the first astigmatic element, said sub-detectors of the first detector assembly being disposed in four different quadrants of an imaginary X–Y co-ordinate system, the X and Y axes being disposed at an angle of 45° with respect to the astigmatic focal lines of the first astigmatic element, a second detector assembly of four sub-detectors in the path of the second sub-beam from the second astigmatic element, said sub-detectors of the second detector assembly being disposed in four different quadrants of an X–Y co-ordinate system, the X and Y axes of the co-ordinate system of said second detector assembly being disposed at an angle of 45° with the astigmatic focal lines of the second astigmatic element.

4,123,653
ARRANGEMENT FOR DETECTING THE ANGULAR POSITION OF A ROTATABLE PART

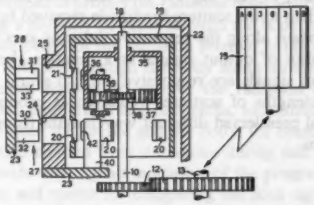
Michele Bovio, Banchette (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Dec. 22, 1976, Ser. No. 753,498

Claims priority, application Italy, Dec. 31, 1975, 70232 A/75

Int. Cl.[2] G01D *5/34*

U.S. Cl. 250—231 SE **5 Claims**



1. An arrangement for detecting a plurality of angular positions of a rotatable part and a complete revolution thereof, said arrangement comprising:

a first rotatable element coupled to said rotatable part, through speed multiplication means, for rotating in synchronism therewith, said first rotatable element comprising, along a first circumferential track, a plurality of windows equally spaced therebetween and positioned to correspond to said angular positions, and, along a second circumferential track, a single window;

a first detecting unit cooperative with said plurality of windows for generating an output signal indicative of said angular positions, at the passage of each one of said plurality of windows in front of said unit;

a second rotatable element coupled to said first rotatable element through speed reduction means and having a single synchronizing element disposed aligned with said second circumferential track; and

a second detecting unit cooperative with said single window and said single synchronizing element for generating another output signal indicative of said complete revolution when said single window and said single synchronizing element are aligned therewith.

4,123,654

METHOD FOR DETERMINING THE DENSITY OF BODIES BY MEANS OF PENETRATING RAYS AND APPARATUS FOR CARRYING OUT SAID METHOD

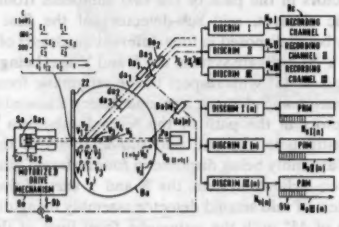
Karl-Hans Reiss, and Klaus Killig, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 4, 1976, Ser. No. 729,461

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1975, 2544354

Int. Cl.[2] G01N *23/20*

U.S. Cl. 250—272 60 Claims



1. The method of determining the density of bodies by means of penetrating rays, which comprises

directing rays of plural preselected different wavelengths from at least one radiation source means to produce at least one beam of rays along a beam path extending from the source means to an internal region of the body whose density is to be measured,

arranging detector means outside of said beam of rays for receiving scattered radiation from said internal region along respective detector axes which intersect said region and form respective angles other than an angle in the vincinity of zero degrees with said beam path, and

responding to the scattered radiation received by said detector means along the respective detector axes to supply a plurality of output signals as a function thereof which output signals are responsive only to plural preselected wavelengths of scattered radiation as produced by the plural preselected different wavelengths from the source means.

4,123,655

ARRANGEMENT FOR PREVENTING THE ALTERATION OF THE PRIMARY BEAM BY UNWANTED PARTICLES, SUCH AS SPUTTER PRODUCTS, CHARGED IONS AND ELECTRONS AND THEIR SECONDARY PROCESSES

Uwe Maixner, Barum, and Dieter Milferstädt, Tespe-Bütlingen, both of Fed. Rep. of Germany, assignors to Gesellschaft für Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthacht-Tesperhude, Fed. Rep. of Germany

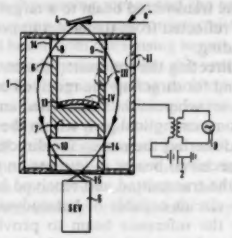
Filed Aug. 24, 1977, Ser. No. 827,307

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1976, 2639033

Int. Cl.[2] H01J *39/00*

U.S. Cl. 250—305 10 Claims

1. An electron or ion beam instrument wherein substantially all surfaces of the instrument adjacent the beam are formed from a metal having a low atomization rate and a very low desorption rate and are provided with closely spaced apertures of less than 0.5 mm diameter extending substantially perpendicular to the surface, the depth of the apertures being at least equal to their opening cross section and the total cross sectional area of the apertures corresponding to at least half of the metal surface in which they are provided.



4,123,656

STORAGE TYPE SMOKE DETECTOR

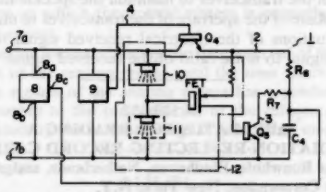
Shigeru Kajii, Kawasaki, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Jul. 6, 1977, Ser. No. 813,182

Claims priority, application Japan, Jul. 7, 1976, 51-8940151[U]

Int. Cl.[2] G01T *1/18*

U.S. Cl. 250—381 4 Claims



1. A storage type smoke detector comprising:

a switching circuit connected between a pair of connection terminals of said detector, for shorting the pair of connection terminals upon receipt of a predetermined voltage,

an oscillator circuit connected in parallel to said switching circuit, for producing a series of pulses,

an ionization smoke sensor connected in parallel to said switching circuit,

a P-channel type field effect transistor having a gate connected to an output end of said ionization smoke sensor and a source received a series of pulses from said oscillator circuit,

a charging circuit including a capacitor connected in series to said connection terminals, for charging to a predetermined voltage effective to activate said switching circuit,

a discharging circuit connected in parallel to said capacitor, for discharging a capacitor voltage by receiving an output pulse from a drain of said P-channel type field effect transistor, and

means connected between the source of said field effect transistor and said oscillator circuit, for periodically switching on said field effect transistor,

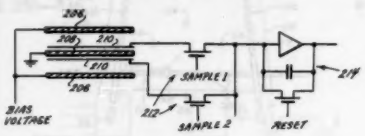
whereby the P-channel type field effect transistor periodically switches on to discharge the capacitor voltage until said transistor turns off by receiving the output from said ionization smoke sensor.

4,123,657

X-RAY DETECTOR

Kenneth E. Krippner, St. Louis, and Albert R. Zacher, Jr., University City, both of Mo., assignors to Artronix Inc., St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,101
Int. Cl.[2] G01T 1/18
U.S. Cl. 250—385 12 Claims



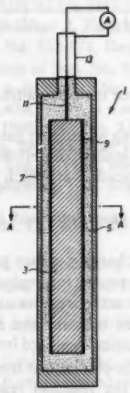
1. A detector for detecting the presence of radiation for subsequent measurement and evaluation by a charge measuring circuit comprising a pressure vessel, the vessel having one wall having means forming a radiation receiving window therein with a covering member transparent to radiation for containing an ionizable gas in the pressure vessel at an elevated pressure, mounting means in the pressure vessel for mounting and retaining detector plates, a plurality of detector plates mounted in the detector, the plates being aligned perpendicular to the window and intersecting the plane of a beam of radiation passing through the window, the plates comprising a first plate connected to means for electrically biasing the plate at a preselected potential, a second plate adjacent to the first plate, the second plate having means to bias the second plate to a second preselected potential, the second plate having adhered thereon a third plate, the third plate being located between the first and second plate, and the third plate collecting charge in the detector for transmission to and detection, measurement and evaluation by a charge measuring circuit.

4,123,658

SELF-POWERED NEUTRON DETECTOR

Lars O. Johansson, Nyköping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed Mar. 10, 1977, Ser. No. 776,424
Claims priority, application Sweden, Mar. 12, 1976, 7603246
Int. Cl.[2] G01T 3/00
U.S. Cl. 250—390 9 Claims



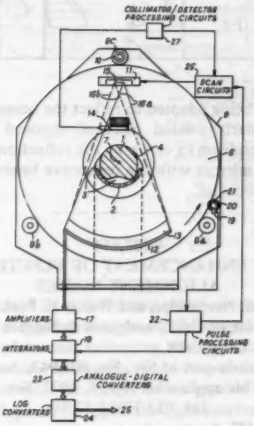
1. In a self-powered neutron detector comprising a centralized emitter core, an insulator surrounding said core, an outer collector in turn surrounding said insulator, and conduit means connected to said emitter core and collector for withdrawal of generated current, the improvement consisting of a layer positioned between the emitter core and the insulator which consists of a material having a high atomic number and a low neutron activation cross section and has a thickness of at most about 5 microns.

4,123,659

RADIOGRAPHY

Colin C. Oliver, Slough, England, assignor to EMI Limited, Middlesex, England

Filed May 23, 1977, Ser. No. 799,712
Claims priority, application United Kingdom, Jun. 1, 1976, 22637/76
Int. Cl.[2] H05G 1/30
U.S. Cl. 250—403 13 Claims



1. An apparatus, for examining a region of the body of a patient by means of penetrating radiation, including a source of radiation arranged to project the radiation from an origin in the source along a plurality of paths through the body, means for displacing the origin of the radiation relative to the source to project the radiation through the body along different paths, detector means disposed to receive the radiation emerging from the body after traversing said paths, monitoring means, disposed between the source and the body, for detecting part of the radiation emitted from the source during said displacement to provide scan signals indicative of the progress of said displacement and means for comparing the scan signals with control signals, indicative of a desired progress of said displacement, to tend to reduce variations of said indicated progress from said desired progress.

4,123,660

OPTICAL ALIGNMENT APPARATUS FOR TELETHERAPY MACHINE OR THE LIKE

Norman H. Horwitz, West Bloomfield, Mich., assignor to William Beaumont Hospital, Royal Oak, Mich.

Filed Feb. 22, 1977, Ser. No. 770,558
Int. Cl.[2] G01B 11/26; G01N 21/00, 23/00
U.S. Cl. 250—491 27 Claims

1. An alignment fixture particularly for alignment of high energy sources including lasers, comprising a centrally apertured support base mountable upon a support;

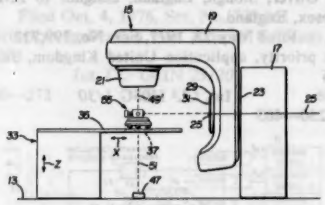
a centrally apertured turntable mounted and journalled upon said support base;

a telescope mount on and secured to said turntable having side walls, top and bottom walls and a longitudinal bore;

a telescope supported within said bore having a longitudinal axis, and an eyepiece with cross hairs, said support base being adjustably mounted whereby said cross hairs are adapted for visible alignment with the epicenter axis of rotation of a teletherapy machine head; said head adapted

to direct a radial high energy beam at right angles to and intersecting said epicenter axis at an isocenter;

and a mirror mounted on each of said telescope mount walls, with their central axes passing through said longitudinal axis;



said mirrors being adapted to reflect the beams of a series of right-angularly related pairs of opposed light sources spaced therefrom to verify by the reflection of said beams upon said mirrors with the respective beams all intersecting said isocenter.

4,123,661

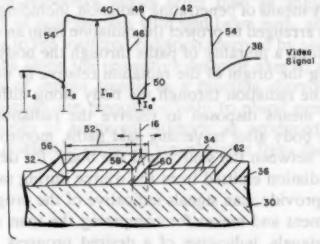
CONTRAST ENHANCEMENT OF ELECTRON BEAM ALIGNMENT MARKS

Edward D. Wolf, Northridge, and Walter E. Perkins, Jr., Woodland Hills, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 601,943, Aug. 4, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,801

Int. Cl.[2] H01J *37/00*

U.S. Cl. 250—492 A **10 Claims**



1. Instrumentality for obtaining alignment in fabricating microcircuit devices including:

a microcircuit workpiece and means permanently placed thereon for defining a pair of alignment marks, said workpiece comprising matter whose atomic number is lower than that of said alignment marks means for enhancing contrast therebetween of backscattered electron video signals obtained from directing an electron beam at said workpiece, and said alignment marks means having a close spacing from one another for augmenting the enhanced contrast as a direct result of the close spacing between said alignment marks means.

4,123,662

SHIELD BAG

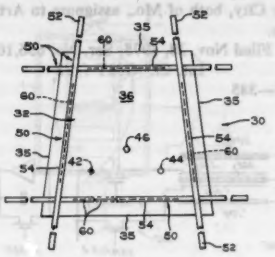
John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Mar. 7, 1977, Ser. No. 775,076

Int. Cl.[2] G21C *11/00*

U.S. Cl. 250—518 **6 Claims**

1. A neutron shield bag having a plurality of flexible walls enclosing a sealed chamber, port means in said bag for filling said chamber with neutron shielding fluid, and bag anchoring means attached to and extending from at least one of said walls to secure said bag in shielding position, said anchoring means



being adapted to detach from a portion of said wall and sever said wall along such portion.

4,123,663

GAS-ETCHING DEVICE

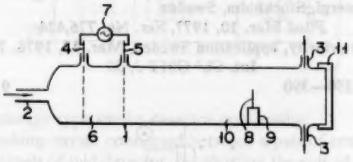
Yasuhiro Horiike, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jan. 8, 1976, Ser. No. 647,448

Claims priority, application Japan, Jan. 22, 1975, 50-8642; Mar. 25, 1975, 50-34994; Mar. 29, 1975, 50-36851

Int. Cl.[2] B01K *1/00*; B23K *9/00*

U.S. Cl. 250—531 **11 Claims**



1. A gas etching device for plasma-free etching of a material comprising:

a vacuum vessel having an etching gas-producing region and a reaction region spaced therefrom, the reaction region having a defined location at which the etching gas reacts with the material,

means to introduce gases into said etching gas-producing region,

a high frequency discharging means positioned with respect to said etching gas-producing region to activate said gases to form a long-life active species as the etching gas,

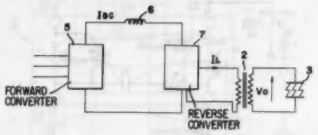
pipe means interposed between the etching gas producing region and the reaction region,

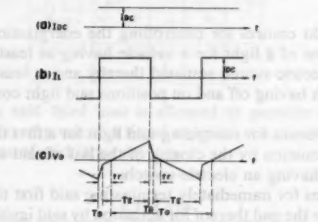
means to withdraw the etching gas from the etching gas-producing region to the reaction region through the pipe means, the reaction region being spaced from said etching gas-producing region a distance fixed to provide electrical isolation of said defined location from electric fields in the etching gas-producing region, whereby the etching gas at said defined location is plasma-free and remains sufficiently activated to etch the material at said defined location.

4,123,664
OZONE GENERATING APPARATUS

Takashi Yamamura; Norikazu Tabata, and Yoshihiko Yamamoto, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 577,456, May 14, 1975, abandoned.
This application Apr. 20, 1977, Ser. No. 789,437
Claims priority, application Japan, Jun. 12, 1974, 49-65484
Int. Cl.[2] C01B *13/11*
U.S. Cl. 250—536 6 Claims





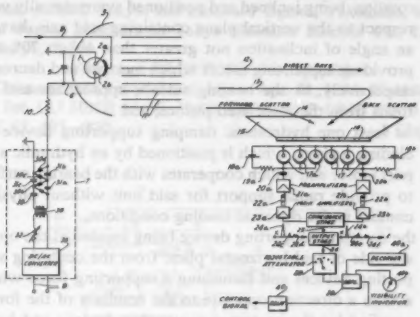
1. An ozone generating apparatus comprising:
an ozone generator having a discharge tube with discharge electrodes, and
a rectangular waveform current feeding device for feeding rectangular waveform current through the discharge electrodes of the discharge tube without a capacitive coupling circuit between the discharge electrodes and the rectangular waveform current feeding device for driving the ozone generator.

4,123,665
ARRANGEMENT FOR DETERMINING THE DENSITY OF NATURAL FOG IN THE ATMOSPHERE

Frank Früngel, Glockenacker 2, Zurich, Switzerland

Continuation of Ser. No. 533,171, Dec. 16, 1974, abandoned, which is a continuation of Ser. No. 433,445, Jan. 15, 1974, abandoned, which is a division of Ser. No. 266,441, Jun. 26, 1972, Pat. No. 3,808,430, which is a continuation of Ser. No. 498,195, Oct. 4, 1965, Pat. No. 3,672,775, which is a continuation of Ser. No. 194,235, May 14, 1962, abandoned. This application Aug. 9, 1976, Ser. No. 712,956
Claims priority, application Fed. Rep. of Germany, May 16, 1961, 33930
Int. Cl.[2] G01N *21/28*
U.S. Cl. 250—565 8 Claims

1. In an arrangement for measuring atmospheric visibility in fog, in combination, light-projecting means operative for projecting into fog-laden atmosphere in the presence of ambient light a beam of pulsed direct light so that a portion of the light of said beam is scattered by fog droplets and thereby converted into pulsed scattered light while the remainder of the light of said beam stays in the form of pulsed direct light; light receiver means so constructed and arranged relative to said light projecting means that said light receiver means does not receive said direct light but does receive scattered light pulses and also ambient light; signal-generating means connected to said light receiver means and operative for generating an electrical light-indicating signal comprised of pulsed first portions corresponding in amplitude and duration to the intensity and duration of the scattered light pulses received by said receiver means and generated during time intervals corresponding to said scattered light pulses and alternating with second portions corresponding in amplitude and duration to the intensity and duration of the ambient light received by said receiver means during the time intervals intermediate the receipt of successive scattered light pulses and generated during the time intervals intermediate the time intervals corresponding to said scattered light pulses; and indicating means including a visibility indicator calibrated in units of atmospheric visibility, operative for

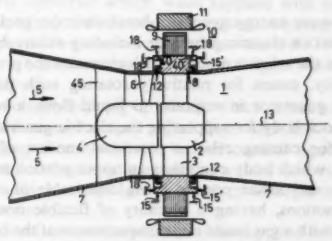


deriving from said light-indicating signal an atmospheric-visibility indication dependent upon the density of said light-scattering fog droplets, said indicating means including suppressing means operative during the time intervals intermediate the receipt by said receiver means of successive scattered light pulses and in dependence upon the light received by said light receiver means but independently of the rate of change of received light for suppressing the effect upon said atmospheric-visibility indication of at least parts of said second portions of said light-indicating signal.

4,123,666
RIM-TYPE HYDROELECTRIC MACHINE

Helmut Miller, Niederrohrdorf, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

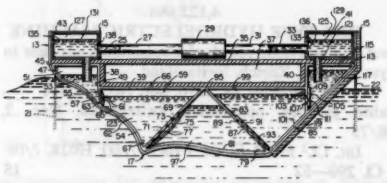
Filed Nov. 23, 1976, Ser. No. 744,244
Claims priority, application Switzerland, Dec. 2, 1975, 15608/75
Int. Cl.[2] F01D *17/04;* F16C *27/00;* H02K *7/08*
U.S. Cl. 290—52 15 Claims



1. A hydroelectric machine including
a. a tube-type hydraulic machine having a bladed wheel which rotates about a horizontal axis and includes fixed, radially extending blades;
b. an annular rim surrounding the bladed wheel and secured to the blades at their outer ends;
c. an electrical machine surrounding the rim and having a rotor attached to the rim,

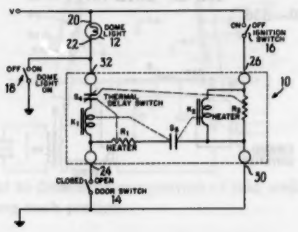
d. the rotor, rim and bladed wheel forming a single rotating unit;
e. an annular bearing surface on said rotating unit;
f. at least two hydrostatic centering supporting devices, each of which includes a piston which is positioned by an hydraulic support motor and which cooperates with the annular bearing surface to radially support said unit without physical contact,
g. the centering supporting devices being in two regions at one side of the horizontal plane containing the axis of rotation, being inclined and positioned symmetrically with respect to the vertical plane containing said axis, having an angle of inclination not greater than 40° to 70°, and providing supporting forces which increase and decrease, respectively, as the bearing surface approaches and retreats from the associated pistons; and
h. at least one hydrostatic damping supporting device including a piston which is positioned by an hydraulic support motor and which cooperates with the bearing surface to provide radial support for said unit without physical contact under dynamic loading conditions,
i. the damping supporting device being located at the opposite side of said horizontal plane from the centering supporting devices and furnishing a supporting force which acts in a direction opposite to the resultant of the forces supplied by the centering supporting devices and has a magnitude which normally is constant and relatively small but increases materially when the bearing surface suddenly moves toward its piston.

4,123,667
WAVE ENERGY GENERATOR-BREAKWATER-BARGE-DOCK
Bert J. Decker, 136 Capen Blvd., Buffalo, N.Y. 14226
Filed Mar. 28, 1977, Ser. No. 781,531
Int. Cl.² F03B 13/12
U.S. Cl. 290—53 **14 Claims**



1. A wave energy generator-breakwater-barge-dock which comprises an electric generator including relatively rotatable portions, the relative motion of which causes the production of electricity, means for relatively rotating such parts of the electric generator in response to liquid flow, a breakwater-barge-dock body for supporting the electric generator and the means for causing relative rotational motion of the parts thereof, which body comprises an upper portion and a lower portion, said lower portion being distortable in response to wave motions, having a plurality of flexible compartments therein with a gas inside said compartments at the tops thereof and a liquid inside said compartments at the bottoms thereof, a plurality of said compartments having flexible internal one-way flow walls separating them and said flexible compartments being communicated with the means for rotating the generator so that in response to wave motion liquid flows from a downstream compartment through the means for rotating the generator, causing rotation of said means, out said means and back to an upstream compartment and through the plurality of compartments having one-way flow walls separating them, to the downstream compartment.

4,123,668
AUTOMOTIVE DOME LIGHT CONTROL WITH VARIABLE-TIME AUTOMATIC HOLDING
Walter Pecota, Boonton, N.J., assignor to Wagner Electric Corporation, St. Louis, Mo.
Filed Jun. 6, 1977, Ser. No. 803,663
Int. Cl.² B60Q 3/02
U.S. Cl. 307—10 LS **15 Claims**

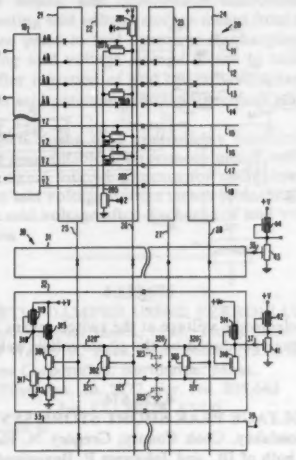


1. A light control for controlling the energization and de-energization of a light for a vehicle having at least one door with an electric switch actuated thereby and at least one ignition switch having off and on positions said light control comprising:
(a) first means for energizing said light for a first time period for actuation by the closing of the last of said at least one door having an electric switch;
(b) means for immediately terminating said first time period before the end thereof for actuation by said ignition switch being switched from its off to its on position during said first time period, whereby said light is immediately extinguished;
(c) second means for energizing said light for a second time period for actuation by the switching of said ignition switch from its on to its off position;
(d) said means for immediately terminating also being effective to terminate said second time period for actuation by said ignition switch being switched from its off position to its on position during said second time period whereby said light is immediately extinguished.

4,123,669
LOGICAL OR CIRCUIT FOR PROGRAMMED LOGIC ARRAYS
William T. Devine, Ulster Park, and William F. Washburn, Hyde Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 8, 1977, Ser. No. 831,582
Int. Cl.² H03K 19/08, 19/30, 17/04; G06F 9/00
U.S. Cl. 307—205 **5 Claims**

1. A binary logical OR circuit comprising:
a plurality of input switching devices, each of said input devices being connected between a first node and a second node for providing a low resistance path between said first node and said second node when a binary logic signal is received at a control input of any one of said input devices;
a first non-linear load connected between a voltage source and said first node and a second load connected between a reference voltage and said second node, said second load having a control input connected to said first node to render said second load less conductive when any one of said plurality of input devices is providing said low resistance path;
a third load connected between said voltage source and an output node, and a output switching device connected between said output node and said second node, said output device having a control input connected to said first node for substantially increasing the resistance of said output device whenever any one of said input devices is

providing a low resistance path between said first node and said second node;



whereby said third load is allowed to provide an output signal in response to a signal received at a control input of any one of said input devices.

4,123,670

TRANSISTOR SWITCHING CIRCUIT

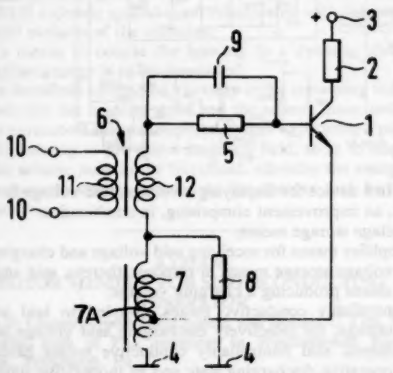
Werner Pollmeier, Verl, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 747,983

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1975, 2255168

Int. Cl.[2] H03K *17/00*

U.S. Cl. 307—254 12 Claims



1. A transistor switching circuit arrangement for switching at least one switching transistor on and off, said circuit arrangement having means for achieving low power dissipation by delaying the change which occurs in base current to the cut-off valve on conversion into the blocked state and by a subsequent brief disruptive operation of the base emitter section and also for achieving fast switching for the transistor by increasing the base current occurring at the time of switching on, said means comprising a choke coil connected between the base circuit of said transistor and a subsequent point through which part of the base-emitter current of said switching transistor is fed and also connected in part between the emitter of said transistor and said subsequent point, wherein the collector-emitter current being switched is passed through said part of the choke coil in positive feedback mode.

4,123,671

INTEGRATED DRIVER CIRCUIT FOR DISPLAY DEVICE

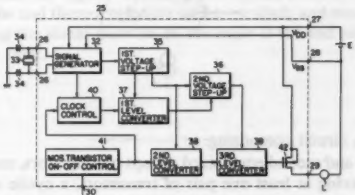
Mitsuo Aihara, Tokyo, and Hisaharu Ogawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1977, Ser. No. 789,690

Claims priority, application Japan, Apr. 21, 1976, 57-44469

Int. Cl.[2] H05B *43/00, 39/00;* H03K *5/02;* G04B *19/30*

U.S. Cl. 307—270 3 Claims



1. A driver circuit arranged as an integrated circuit, for use with an external display device, comprising:

a power source;

a signal generator for producing a first output signal having a first voltage level when supplied by the power source;

a field effect transistor connected across the power source through the external display device, the field effect transistor having a gate which controls the field effect transistor to actuate the display device upon the application to the gate of a control voltage level n-fold ($n > 1$) larger than that of the power source;

an ON-OFF control circuit for producing a first control signal in response to conduction and non-conduction of external switching means provided outside of said integrated circuit;

a first voltage stepping-up circuit for producing a second output signal having a second voltage level by stepping-up said first output signal from said signal generator;

a first level converter which, when supplied with said second output signal from said first voltage stepping-up circuit and said first control signal from said ON-OFF control circuit, produces a second control signal having said second level;

a second voltage stepping-up circuit which, when supplied with said second output signal from said first voltage stepping-up circuit and said second control signal from said first level converter produces a third output signal having a third voltage level n-fold ($n > 1$) larger than the power source;

a second level converter which, when supplied with said second output signal from said first voltage stepping-up circuit and said first control signal from said ON-OFF control circuit, produces a third control signal having said second level; and

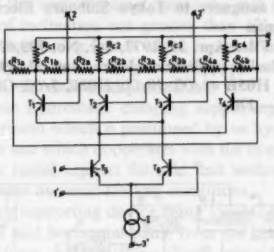
a third level converter which, when supplied with said third output signal from said second voltage stepping-up circuit and said third control signal from said second level converter, produces a fourth control signal having said third level, said fourth control signal being applied to the gate of said field effect transistor.

4,123,672

CIRCUIT ARRANGEMENT FOR FREQUENCY DIVISION OF HIGH-FREQUENCY PULSES

Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 635,987, Nov. 28, 1975, abandoned.
This application Jun. 2, 1977, Ser. No. 802,725
Claims priority, application Netherlands, Nov. 29, 1974, 7415575
Int. Cl.[2] H03K *21/00*
U.S. Cl. 307—303 7 Claims



1. A circuit comprising:

first and second equal sized groups of transistors, each group having at least one pair of transistors, a cyclic electrical sequence being defined for said transistors, said sequence alternating between said groups so that each of said transistors is followed in said sequence by a transistor of the other group, each of said transistors having a collector, a base and an emitter;

a plurality of electrical resistances, each of said resistances connecting the collector of a transistor in said cyclic sequence to the collector of the following transistor in said sequence, each of said electrical resistances having a tapping electrically connected directly to the base of the transistor which preceedes, in said sequence, the pair of transistors between the collectors of which said tapping is disposed;

first and second driver transistors, the output from said first driver transistor being electrically connected to each of the emitters of the transistors of said first group, the output from said second driver transistor being electrically connected to each of the emitters of the transistors of said second group;

means for alternately driving said first and second driver transistors into conduction; and

output means electrically connected to at least one of said tappings.

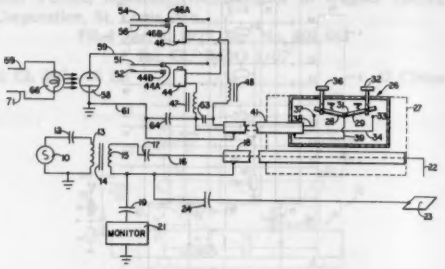
4,123,673

CONTROL CIRCUIT FOR AN ELECTRICAL DEVICE

Donald I. Gonser, Forest Park, Ohio, assignor to Dentsply Research and Development Corporation, Milford, Del.

Filed Mar. 14, 1977, Ser. No. 777,077
Int. Cl.[2] A61B *17/36*
U.S. Cl. 307—326 8 Claims

1. A control circuit for a radiofrequency electrosurgical device including a radiofrequency generator, a handpiece, an active electrode means supported on the handpiece, and switch means mounted in the handpiece which comprises photovoltaic cell means and relay means connected in series with the switch means, means for illuminating the photovoltaic cell means, whereby closing of contacts of the switch means causes acturation of the relay means, and means connected to the relay means for causing the radiofrequency generator to power



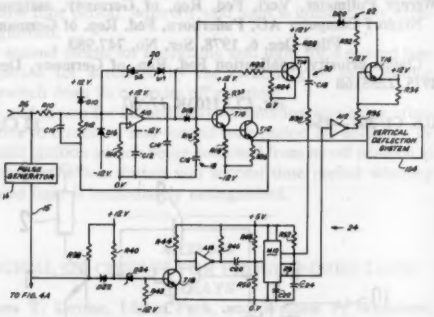
the active electrode, voltage at the switch means being limited by the voltage produced by the photovoltaic cell means.

4,123,674

VOLTAGE PEAK SHORT STORE SYSTEM

Gary F. Comiskey, Cook County; Gregory N. Hesse, DuPage County, both of Ill., and Johannes P. Bovenlander, Kormmenie, Netherlands, assignors to Sun Electric Corporation, Chicago, Ill.

Division of Ser. No. 640,220, Dec. 12, 1975, Pat. No. 4,019,127.
This application Aug. 19, 1976, Ser. No. 715,975
Int. Cl.[2] H03K *17/56, 5/20;* G01R *29/00*
U.S. Cl. 307—351 8 Claims



1. In a device for displaying a voltage, said voltage having a peak, an improvement comprising, in combination:

voltage storage means;

amplifier means for receiving said voltage and charging said voltage storage means in response thereto, said amplifier means producing a charging voltage;

controllably conductive means, coupled to said voltage storage, for selectively discharging said voltage storage means, said controllably conductive means having an operative discharging state and an inoperative state;

pulse generating means for receiving said voltage and generating a trigger pulse in response thereto;

control means, coupled to said controllably conductive means and said pulse generating means, for controlling said controllably conductive means, said control means placing said controllably conductive means in said inoperative state in response to said trigger pulse and placing said controllably conductive means in said operative discharging state a predetermined time after entering said inoperative state, whereby said voltage storage means is charged to a potential substantially proportional to said peak prior to discharge; and

controllable interconnect means, coupled to said voltage storage means and said amplifier means and responsive to

said charging voltage and said potential, for connecting and disconnecting said voltage storage means and said amplifier means, said controllable interconnect means disconnecting said voltage storage means from said amplifier means prior to said operative discharging state and connecting said voltage storage means to said amplifier means after initiation of said operative discharging state whenever said potential substantially equals said charging voltage;

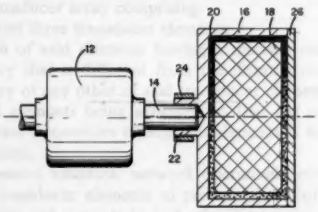
said amplifier means, said controllably conductive means and said controllable interconnect means cooperatively defining signal following means for maintaining said potential on said voltage storage means substantially proportional to said voltage after discharge of said voltage storage means.

4,123,675

INERTIA DAMPER USING FERROFLUID

Ronald Moskowitz, Merrimack, N.H.; Philip Stahl, Holliston, Mass., and Walter R. Reed, Merrimack, N.H., assignors to Ferrofluidics Corporation, Burlington, Mass.

Filed Jun. 13, 1977, Ser. No. 805,643
Int. Cl.² H02K *37/00*
U.S. Cl. 310—49 R **14 Claims**



1. A viscous-fluid inertia damper, which damper comprises:
(a) a housing having a chamber therein;
(b) a nonferromagnetic seismic mass disposed in the chamber and in a closely spaced-apart relationship with the internal wall surfaces of the chamber;
(c) a means to couple the housing to a dynamic element whose energy is to be dampened;
(d) a ferrofluid of selected viscosity in the remaining volume between the housing walls and the seismic mass; and
(e) a permanent magnet disposed within or forming a part of the housing to provide a magnetic field, so as to suspend the seismic mass in the ferrofluid, whereby the energy of a dynamic system coupled to the damper may be dissipated.

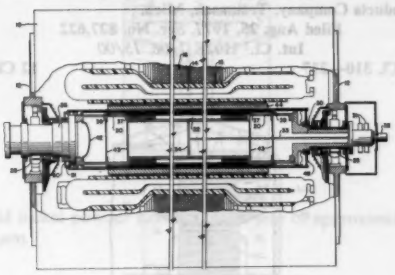
4,123,676

ROTOR MEMBER FOR SUPERCONDUCTING GENERATOR

Glenn D. Cooper, North Huntingdon, and Donald C. Litz, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 22, 1976, Ser. No. 734,943
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **3 Claims**

1. A rotor for a dynamoelectric machine comprising a hollow cylindrical rotor body carrying a field winding of superconducting material, means for circulating a cryogenic coolant fluid through said field winding, shaft portions at opposite ends of the rotor body, one of said shaft portions being a drive shaft, a cylindrical radiation shield surrounding the rotor body concentrically therewith and attached to the rotor at the ends of the radiation shield, a cylindrical vacuum enclosure disposed concentrically with the rotor body outside the radiation shield and spaced radially therefrom, the vacuum enclosure being attached to the rotor adjacent each end thereof with a sealing attachment and the space within the enclosure being evacuated, a cylindrical damper-shield member of high electrical conductivity surrounding the rotor body concentrically therewith outside the vacuum enclosure and spaced radially there-



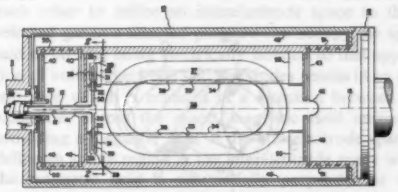
from, means for rigidly attaching said shield member to the rotor at the end thereof opposite said drive shaft, and means for supporting the shield member on the rotor at the end adjacent the drive shaft.

4,123,677

SELF-REGULATING TRANSPORT MECHANISM FOR SUPER-CONDUCTIVE ROTOR REFRIGERANT

Evangelos T. Laskaris, Schenectady; Bruce B. Gamble, Elnora, and Burton D. Hatch, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,168
Int. Cl.² H02K *9/00*
U.S. Cl. 310—52 **13 Claims**



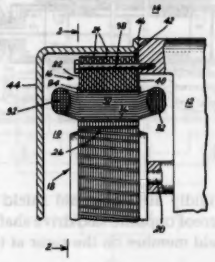
1. A self-regulating transport mechanism for superconductive rotor winding coolant comprising:
a rotating conduit extending axially into the interior of a rotor and carrying a flow of coolant in the liquid phase, at constant pressure;
open-ended radial tube means within said rotor attached to, and rotatable with, said conduit, said radial tube means having an inner diameter sufficiently large to accommodate flow of coolant in the liquid phase along its inner surface and to accommodate flow of coolant in the gaseous phase through its central core, said radial tube means delivering said coolant to the interior of said rotor so as to maintain a layer of liquefied coolant of predetermined depth extending radially inward from the interior surface of said rotor and a central core of evaporated coolant in said rotor during rotation of said rotor, said radial tube means having its open end submerged in said layer of liquefied coolant; and
tubing means in gaseous communication with said central core of evaporated coolant for conducting said evaporated coolant out of the interior of said rotor.

4,123,678

LAMINATED STATOR CORE MEMBER SECURED ONLY BY BONDING THE WINDINGS

Thomas A. Jacoby, Tecumseh, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 25, 1977, Ser. No. 827,622
Int. Cl.[2] H02K *1/06, 15/00*
U.S. Cl. 310—217 12 Claims



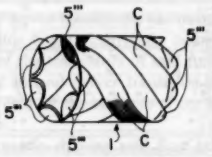
1. In a magnetic device comprising a core member formed of a stacked assembly of relatively thin laminations of magnetic material, and a winding formed of a plurality of turns of magnet wire embracing a part of said core member, the improvement wherein said turns are bonded together and comprise the sole means for holding said laminations in assembled relation.

4,123,679

CORELESS CYLINDRICAL ARMATURE FOR ELECTRICAL ROTARY MACHINES

Takao Miyasaka, Yokohama, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Feb. 2, 1977, Ser. No. 765,104
Claims priority, application Japan, Feb. 5, 1976, 51-11760; Apr. 14, 1976, 51-46526[U]; Apr. 14, 1976, 51-46527[U]
Int. Cl.[2] H02K *1/22*
U.S. Cl. 310—266 20 Claims



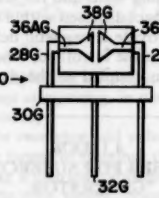
1. A coreless armature for an electrical rotary machine, comprising:
a main shaft;
a bracket secured to said main shaft;
a rectifier secured to said bracket; and
a coil cylinder having two opposed peripheral edges bounding a peripheral surface and including therein at least one coil unit connected at respective connections with said rectifier,
characterized in that
said coil unit comprises:
a plurality of first lead wire portions, *n* in number, each extending on said peripheral surface over a range corresponding to a respective first electrical angle of 180° from along one peripheral edge of said cylinder toward the other peripheral edge thereof;
a respective plurality of second lead wire portions each extending on said peripheral surface over a range corresponding to a respective further, second electrical angle of 180° from along said other peripheral edge of said cylinder toward said one peripheral edge thereof;
each first lead wire portion joining and forming with each respective second lead wire portion a respective continuous lead wire which extends completely circumferentially of said peripheral surface;
the first through *n*th such lead wires being regularly distributed in a circular series angularly of said peripheral surface;
each first lead wire portion being connected to the respective second lead wire portion of the respective angularly next lead wire in said circular series, thereby forming a said connection, each such connection being connected to said rectifier;
the breadth of each lead wire being such as to provide, complementarily with
each lead wire being sufficiently broad, angularly of said peripheral surface, that all of said lead wires, considered together, provide a full pitch, substantially completely double-layer winding, excepting at a respective plurality of relatively axially short apical regions at each peripheral edge of said cylinder, typically where a respective first lead wire joins a respective second lead wire, where should each such region not be bent double upon itself along a generally circumferentially extending axis intermediate the axial extent thereof longitudinally of said cylinder the winding remains of single layer.

4,123,680

PIEZOELECTRIC QUARTZ CRYSTAL PRODUCTS AND FABRICATION METHODS THEREFOR

Daryl M. Kemper, and Louis A. Dick, both of Litchfield Park, Ariz., assignors to Tyco Crystal Products, Inc., Phoenix, Ariz.

Filed May 26, 1977, Ser. No. 800,725
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—320 27 Claims



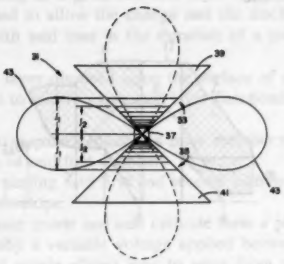
1. A piezoelectric device comprising, in combination, a pie shaped piezoelectric substrate at least two electrically conductive support members connected to said pie shaped piezoelectric substrate, at least one pie shaped electrode located on each surface of said pie shaped piezoelectric substrate, said one pie shaped electrode on one surface of said pie shaped piezoelectric substrate being electrically connected to one of said two electrically conductive support members, said one pie shaped electrode on the other surface of said pie shaped piezoelectric substrate being electrically connected to the other of said two electrically conductive support members, said one pie shaped electrode located on one surface of said pie shaped piezoelectric substrate overlapping and in registry with said one pie shaped electrode located on the other surface of said pie shaped piezoelectric substrate.

4,123,681

WIDE BAND PROPORTIONAL TRANSDUCER ARRAY

Michael L. Barlow, Silverdale, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 501,918, Aug. 29, 1974, abandoned.
This application Nov. 19, 1976, Ser. No. 743,441
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—322 2 Claims



1. A transducer array comprising:
(a) at least three transducer elements;
(b) each of said elements having a discrete resonant frequency that is different from the discrete resonant frequency of any other of said transducer elements;
(c) said elements being arranged so that the ratio of the resonant frequencies of adjacent elements is substantially constant;
(d) a passive electrical network operatively connected to said transducer elements to provide the electrical drive voltages and currents to each of said transducer elements for operating predetermined elements at their resonant frequencies over said band width;
(e) said ratio is selected to have a predetermined value of about 1.26 such that the composite impedence of said array is about constant over its entire band width;
(f) said elements are arranged to form at least one cone wherein said elements of said at least one cone are of progressively decreasing size and progressively increasing frequency;
(g) the ratio of the heights, diameters and thicknesses of adjacent elements are substantially constant;
(h) the ratio of said frequencies is about inversely proportional to the ratios of said heights, diameters and thicknesses; and
(i) said transducer array is for operating only as a receiver or only as a transmitter at any instant of time.

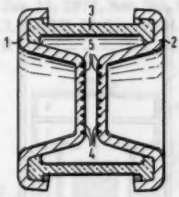
4,123,682

COLD CATHODE GAS-DISCHARGE TUBE

Gerhard Lange, and Gerhard Peche, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 8, 1975, Ser. No. 610,927
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1974, 2445063
Int. Cl.[2] H01J *17/00*
U.S. Cl. 313—54 3 Claims

1. A surge voltage arrestor comprising:
a gas-tight electrical insulating housing;
an ionizable gas in said housing;
a pair of spaced apart electrodes symmetrically mounted in said gas-tight housing with their frontal surfaces facing each other;
a preparation of nickel power containing Nickel 63 radioactive material for pre-ionizing said gas;
said radioactive material being adhered to at least a portion of the surface of both of said electrodes; and



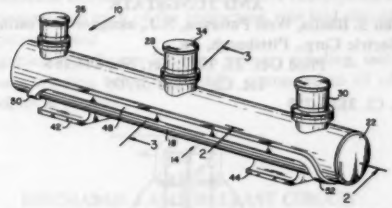
said nickel powder having a grain size of approximately 8 μm.

4,123,683

ELONGATED CROSSED-FIELD SWITCH DEVICE

Robin J. Harvey, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 15, 1977, Ser. No. 833,527
Int. Cl.[2] H01J *1/50*
U.S. Cl. 313—156 11 Claims



1. A crossed-field switch device comprising:
an anode electrode and a cathode electrode spaced from each other to define an interelectrode space so that a selected gas at a selected pressure can occupy the space, said electrodes being electrically isolated so that application of voltage between said electrodes results in an electric field which is oriented in a direction between said electrodes across the space, magnetic field means for providing a magnetic field in the interelectrode space to define an active region in the interelectrode space where the magnetic field is substantially perpendicular with respect to the electric field so that electrons traverse a closed path in the active region to cause cascading ionization which results in self-sustaining plasma and interelectrode electrical conduction, the improvement comprising:
the path of the active region in the interelectrode space being configured with an elongated shape having greater length than width to reduce the overall width as compared to a circular path having the same length.

4,123,684

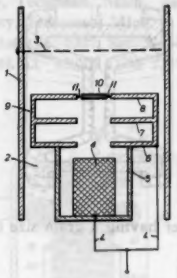
THYRATRONS

Hugh Menown, Writtle, and Robert J. Wheldon, Chelmsford, both of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Mar. 16, 1977, Ser. No. 778,255
Claims priority, application United Kingdom, Mar. 18, 1976, 10889/76
Int. Cl.[2] H01J *17/04*
U.S. Cl. 313—205 13 Claims

1. A thyratron including a thermionic cathode, at least a first control electrode, and a baffled structure arranged between

said thermionic cathode and said first control electrode, said baffled structure comprising a plurality of baffled plates forming at least two transversely extending cavities connected to be at cathode potential.

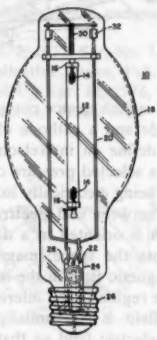


4,123,685

HID LAMP ELECTRODE COMPRISING SOLID SOLUTION OF DIBARIUM CALCIUM MOLYBDATE AND TUNGSTATE

Ranbir S. Bhalla, West Paterson, N.J., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 21, 1977, Ser. No. 844,154
Int. Cl.² H01J *61/06*
U.S. Cl. 313—218 **5 Claims**



1. In combination with a high-intensity vapor discharge lamp comprising a radiation-transmitting arc tube having electrodes operatively supported therein proximate the ends thereof and adapted to have an elongated arc discharge maintained therebetween, and means for connecting said electrodes to an energizing power source, the improved structure for said electrodes each of which comprises:

(a) an elongated refractory metal member having one end portion thereof supported proximate an end of said arc tube and the other end portion of said metal member projecting a short distance inwardly within said arc tube, and overfitting refractory metal coil means carried on the inwardly projecting portion of said elongated metal member; and

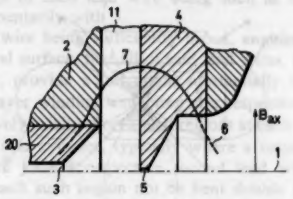
(b) electron emissive material carried intermediate turns of said overfitting coil means, said electron emissive material consisting essentially of a solid solution of dibarium calcium tungstate (Ba_2CaWO_6) and dibarium calcium molybdate (Ba_2CaMoO_6) wherein the molar ratio of said tungstate to said molybdate falls within the range of from 9:1 to 1:9.

4,123,686

ION GENERATING SOURCE

Roderich Keller, Darmstadt, and Michael Müller, Mannheim, both of Fed. Rep. of Germany, assignors to Gesellschaft für Schwerionenforschung mbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 774,655
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610165
Int. Cl.² H01J *27/00*
U.S. Cl. 313—230 **10 Claims**



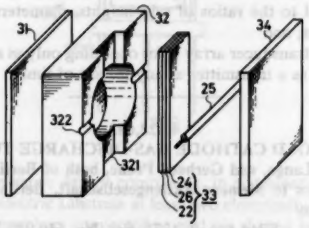
1. In a charged ion generating source composed of a glow cathode, an intermediate electrode and an anode electrode having a common axis of symmetry, each electrode being provided with an opening constituting an axial passage extending along the common axis of symmetry, means defining a discharge chamber bordered by the electrodes and in which electrons and/or auxiliary gas ions form the charged ions, and a system composed of a coil and a magnetic yoke for producing a magnetic field having an axial component along the common axis of symmetry, the improvement wherein said axial passage of said opening of said anode electrode is located in a region where the magnitude of the axial component of the flux density of the magnetic field is close to the maximum value of that component.

4,123,687

DISPLAY SYSTEM USING LOW ENERGY ELECTRONS

Raymond Poirier, and Nicolas Szydlo, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 19, 1977, Ser. No. 798,568
Claims priority, application France, May 21, 1976, 76 15516
Int. Cl.² H01J *61/067, 61/44*
U.S. Cl. 313—484 **6 Claims**



1. A display system comprising:

a first transparent insulating plate member in which recesses have been cut out, said recesses forming a matrix with rows and columns, and being filled with a gas at such a pressure that said gas forms an ionic plasma in an electric field, said member bearing a first and a second series of notches forming lines intersecting one another at the centers of said recesses, the notches of the first series being laid out in lines parallel to rows of said matrix, and the notches of the second series being laid out in lines parallel to columns of said matrix;

a first series of electrodes sunk in the first series of notches, said electrodes being made of strips comprising starting from the bottoms of the notches a thin metallic plate to function as an anode, a layer of insulating material and a layer of a material containing phosphors capable of emitting visible light when receiving ions from said plasma;

a second series of electrodes sunk in the second series of notches, said electrodes being made of metallic wires each covered with a layer of an insulating material, each wire functioning as a grid, and said layer having a thickness calculated to allow the charge and the discharge of said grids with said ions in the duration of a predetermined time;

a metallic layer disposed upon the surface of said member opposite to said recesses, said layer functioning as a cathode;

a second transparent insulating plate member covering the recesses of said first member;

means for sealing said first and second members to form a sealed envelope;

whereby said anode and said cathode form a plasma;

and whereby a variable voltage applied between said grid and said anode allows ions to issue from the cathode-anode space and fall upon phosphors contained in said strips.

4,123,688

SPARK PLUG CAP

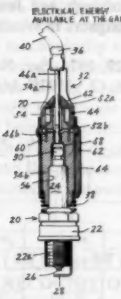
Masazi Yoshikawa, and Tomoe Sawada, both of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 656,723, Feb. 9, 1976, Pat. No. 4,082,980. This application Jan. 5, 1977, Ser. No. 756,919

Claims priority, application Japan, Feb. 13, 1975, 50-21425[U]; May 15, 1975, 50-65019[U]; May 17, 1975, 50-66088[U]; Jun. 12, 1975, 50-81296[U]

Int. Cl.² H01J *7/44, 13/46, 23/16;* **H01K** *1/62*

U.S. Cl. 315—58 **17 Claims**



1. A spark plug cap for electrically and mechanically connecting a spark plug to an ignition current supply cord to intensify sparking across the gap between central and ground electrodes of the spark plug, comprising an insulating body, said body having means for mechanically connecting said cap to said spark plug and terminal means adapted to be connected to said supply cord, electrically conductive means extending through said body to electrically connect said terminal means to the center electrode of said spark plug and at least one capacitor unit supported within said body and electrically connected in parallel to said spark gap and characterized in that said capacitor unit comprises a cylindrical dielectric through which said conductive means extends and a pair of electrodes positioned on the opposite end faces of said cylindrical dielectric base.

4,123,689

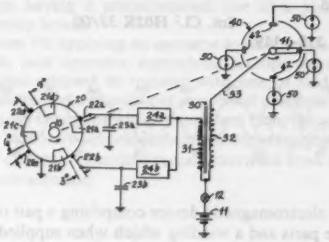
TRANSIENT INTERMODULATION IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Jul. 11, 1977, Ser. No. 814,456

Int. Cl.² H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 R **9 Claims**



1. An ignition system having electrical igniters and producing a plural number of transient signals during firing period of any one of the igniters, comprising the combination of:

a timer, driven during operative mode of the system, having a plural number of electrical contactors coupled thereto;

an electrical circuit, composed of passive components only, connected to each of the contactors, one said circuit per contactor; and

an ignition transformer having a primary winding, said primary winding being electrically connected to all of the electrical circuits.

4,123,690

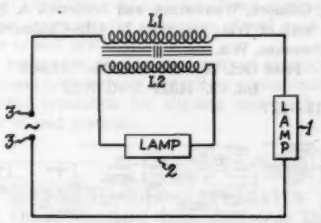
DISCHARGE LAMP BALLAST CIRCUIT

Mitchell M. Osteen, Zirconia, N.C., assignor to General Electric Company, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,005

Int. Cl.² H05B *41/16*

U.S. Cl. 315—258 **8 Claims**

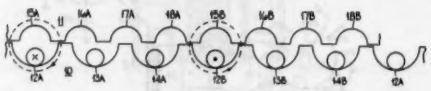


4. Lamp operating apparatus comprising, in combination an alternating current source, a first circuit comprising a first inductor and a first gaseous discharge lamp connected in series across said alternating current source, and a second circuit comprising a second inductor inductively coupled to said first inductor and a second gaseous discharge lamp connected across said second inductor, the current in said second circuit being derived solely from the inductive coupling of said first and second inductors, the output current of said second circuit leading the output current of said first circuit, whereby the power factor of said alternating current source is improved, said apparatus including a magnetic core forming a closed magnetic circuit and having spaced leg portions, said first and second inductors respectively comprising first and second coils wound on at least one of said leg portions and substantially spaced from each other.

4,123,691
ELECTROMAGNETIC DEVICES

Alec H. Seilly, North Wembley, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation-in-part of Ser. No. 701,342, Jun. 30, 1976, abandoned. This application Aug. 22, 1977, Ser. No. 826,755
Claims priority, application United Kingdom, Jul. 5, 1975, 28435/75
Int. Cl.² H02K *33/00*
U.S. Cl. 318—119 4 Claims

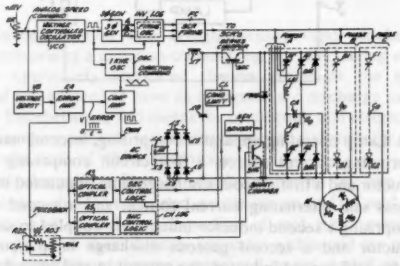


1. An electromagnetic device comprising a pair of relatively movable parts and a winding which when supplied with electric current generates a magnetic field which results in a force acting between the parts to cause linear relative movement of the parts, the first of said parts defining a generally cylindrical working surface whilst the second part has a working surface presented to but spaced from the working surface of said first part, one of said parts having formed on its working surface at least three screw thread formations, the thread formations each consisting of a pair of threads, winding sets associated with the thread formations respectively, each winding set comprising windings located in said threads respectively and through which in use, electric current can be caused to flow in opposite directions, the working surface of the other of said parts having one extra number of thread formations with the threads of the formations having the same helix angle, whereby upon energisation of the windings the magnetic field produced by current flow in the windings will cause axial movement of the parts to effect a decrease in the reluctance of the magnetic paths between the parts and connection means whereby the windings of the sets can be selectively energised to produce relative movement of said parts.

4,123,692
ADJUSTABLE SPEED ELECTRIC MOTOR DRIVE HAVING CONSTANT HARMONIC CONTENT

Thomas P. Gilmore, Wauwatosa, and Frederick A. Stich, Milwaukee, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Oct. 26, 1976, Ser. No. 735,609
Int. Cl.² H02P *5/40, 7/62*
U.S. Cl. 318—227 29 Claims



24. An adjustable speed electric motor drive which does not require a filter between the series chopper and the inverter comprising, in combination,

a unidirectional electric power source,

an inverter having *n* output phases and positive and negative load current carrying semiconductor switches in series in each output phase with an output terminal at the junction therebetween for connection to the respective phase windings of said motor and also having feedback diodes in inverse polarity shunt relation with said semiconductor switches,

a semiconductor transistor series chopper in one polarity of said source between said source and said inverter,

a semiconductor shunt chopper switch connected at the output of said series chopper in shunt with said series arrangement of positive and negative switches in each inverter output phase,

a free-wheeling diode in inverse polarity parallel relation with said shunt chopper switch,

voltage controlled oscillator means for deriving a train of modulation frequency controlling pulses whose frequency is a function of the magnitude of an analog speed reference signal,

a generator for deriving *n* phase reference waves synchronized to said modulation frequency controlling pulses and displaced 360/*n* electrical degrees each of which is associated with one phase of said inverter,

means for controlling the switching of the semiconductor switches in the respective phases of said inverter as a function of the associated phase reference waves,

oscillator means for generating a train of constant frequency generally triangular ramp pulses,

sensing means for deriving a feedback signal proportional to the average voltage across said shunt chopper switch,

means for comparing said analog speed reference signal to said feedback signal and for deriving a unidirectional error signal which is a function of their difference,

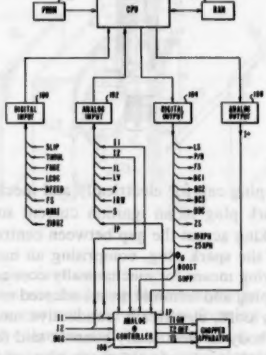
means for comparing said error signal to said train of ramp pulses to derive variable width signals at said constant frequency whose width is a function of the magnitude of said error signal, and

pulse width modulating means for switching said series chopper in accordance with said variable width signals and for switching said shunt chopper switch to the opposite conductive state from said series chopper.

4,123,693
TRANSIT VEHICLE GENERATED VOLTAGE CONTROL APPARATUS AND METHOD

Larry W. Anderson, Pittsburgh, and James H. Franz, Jr., Murrysville both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1976, Ser. No. 709,685
Int. Cl.² H02P *3/14*
U.S. Cl. 318—376 9 Claims



1. In control apparatus for a chopper operative with a power supply line to energize an electric motor, the combination of:

means including said chopper for controlling the generated energy of the motor during braking,

means responsive to the voltage of the supply line;

means for providing at least one predetermined limit for said supply line voltage; and

means for comparing said supply line voltage with said limit and coupled with said generated energy controlling means to provide a predetermined reduction of the generated energy of said motor to establish the supply line voltage below said limit.

4,123,694

CIRCUIT ARRANGEMENT FOR A WIPER DRIVING MOTOR

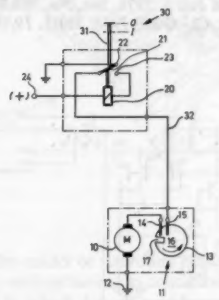
Marcel Andrei-Alexandru, Bietigheim-Bissingen; Gunther Gille, Sersheim; Horst Goertler, Sachsenheim; Hans Prohaska, Bietigheim-Bissingen; Walter Steeb, Bittenfeld, and Wolfgang Spieth, Freiberg, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,502

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645707

Int. Cl.[2] H02P *1/04*

U.S. Cl. 318—443 **25 Claims**



1. A circuit arrangement for driving a wiper motor, comprising: a controllable switching element for switching a motor operating circuit, a limit switch having a pair of normally closed contacts serially coupled with said switch element and said limit switch being mechanically coupled to the output of said wiper motor and being responsive thereto to open said normally closed contacts during a portion of the operating cycle of said wiper motor to provide a disconnection signal, said switching element being controllable by a manually actuable operating switch and by said disconnection signal of said limit switch, and wherein the disconnection signal of the limit switch is directly conducted to the switching element through the motor supply lead.

4,123,695

PATTERN RECOGNITION SYSTEM

Jacques A. G. Hale, Crawley Down, and Alan Robert Turner-Smith, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 30, 1975, Ser. No. 618,031

Claims priority, application United Kingdom, Oct. 4, 1974, 43136/74

Int. Cl.[2] G05B *13/00*

U.S. Cl. 318—561 **11 Claims**

1. An automatic machine tool system comprising a stationary bed;

a two-dimensional positioning table supported on said bed having an operative plane;

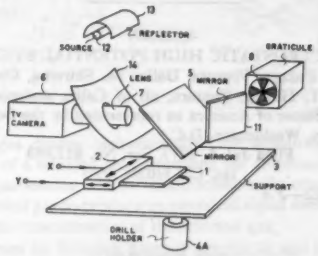
means for measuring the displacement of said table in each said dimension relative to said bed;

a tool holder fixed relative to said bed and having an operative center;

visual input means fixed relative to said bed having a field of view including a portion of said table containing said operative center, comprising:

(a) means for identifying a predetermined mark inherently present on a surface of an object fixed in a predetermined position on said table, the surface lying in said operative plane, and detecting in said operative plane a plurality of picture elements, each of said picture elements having a predetermined one of a plurality of intensity levels;

(b) means for applying an operator to said predetermined mark, said operator comprising an operative center element adapted to register with one of said picture elements, and a plurality of peripheral elements situated on rows extending radially outward from the region of said operative center element for registering with picture elements extending radially outward from said one picture element;



(c) means for producing a recognition signal if at least one of said peripheral elements in each of said rows satisfies the condition that said at least one peripheral element is in registration with a picture element having an intensity level which differs from that of said one picture element in registration with said operative center element by at least a predetermined threshold amount;

means for introducing a graticule having a center into the field of view of said visual input means so that said center of said graticule is substantially aligned with said operative center;

means for identifying the location of said graticule;

means for measuring the separation of said mark from said center of said graticule; and

driving means for producing a relative displacement between said table and said tool holder corresponding to said measured separation for aligning said mark with said center of said graticule.

4,123,696

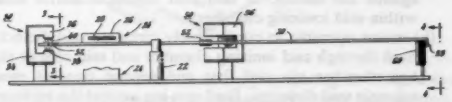
SIGNAL HANDLING APPARATUS

Everett O. Olsen, Wrentham, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Division of Ser. No. 543,443, Jan. 23, 1975, abandoned, which is a continuation of Ser. No. 333,997, Feb. 20, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 641,075

Int. Cl.[2] G05B *5/01*

U.S. Cl. 318—623 **13 Claims**



1. Positioning apparatus for use with industrial process instrument systems and the like, comprising:

actuator means responsive to a control signal and producing a control force for positioning a movable member;

sensing means associated with said movable member and including means to produce a signal representing the position of said member;

feedback means coupled to said sensing means to direct to the input of said actuator means a feedback signal to cause said movable member to be positioned in correspondence to the magnitude of said control signal; and

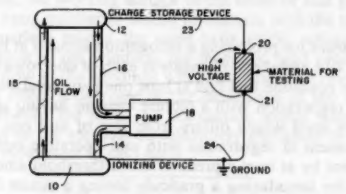
magnetic means including a mass of small magnetizable particles engaging the surface of a part movable with said member, said particles being magnetically influenced to develop a frictional engagement with said surface and producing on said member a frictional restraining force opposing the effect of said control force, said frictional restraining force having a magnitude less than said control force and permitting while resisting any movement of said member responsive to said control force, said frictional restraining force being capable of holding said member in fixed position when said actuator means is inactive.

4,123,697

ELECTROSTATIC HIGH POTENTIAL SYSTEM

Aleksy J. Paszyc, Ventura; Dallas M. Shiroma, Oxnard, and Kwang T. Huang, Ventura, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1977, Ser. No. 812,883
Int. Cl.[2] H02N 1/10
U.S. Cl. 322—2 A **12 Claims**



1. A high voltage generating system, comprising:

(a) a conductive ionizing chamber having a fluid inlet at one side thereof and a fluid outlet at the opposite side thereof;

(b) a first dielectric baffle means of large surface area within said ionizing chamber between the fluid inlet and the fluid outlet thereto;

(c) a conductive charge storage chamber having a fluid inlet at one side thereof and a fluid outlet at the opposite side thereof;

(d) a second dielectric baffle means of large surface area within said charge storage chamber between the fluid inlet and the fluid outlet thereto;

(e) a first dielectric conduit means connected between the fluid outlet from said ionizing chamber and the fluid inlet to said charge storage chamber;

(f) a second dielectric conduit means connected between the fluid outlet from said charge storage chamber and the fluid inlet to said ionizing chamber;

(g) a dielectric fluid of high resistivity filling said ionizing chamber, said charge storage chamber, and said first and second dielectric conduit means; said dielectric fluid being operable to generate electrostatic charges when moved against the surface of said first dielectric baffle means within said ionizing chamber;

(h) means operable to continuously circulate said dielectric fluid through said ionizing chamber and said charge storage chamber via said first and second conduit means wherein said dielectric fluid moving against the surface of said first dielectric baffle means is electrostatically charged;

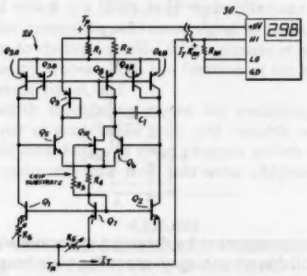
(i) electrode means being located within said second dielectric baffle means and electrically connected to said charge storage chamber between the inlet and outlet thereto; said electrode means being operable to draw off the electrostatic charges from said charged dielectric fluid as said fluid is circulated through said charge storage chamber wherein an electrostatic high potential is produced and made available for use between said ionizing chamber and said charge storage chamber.

4,123,698

INTEGRATED CIRCUIT TWO TERMINAL TEMPERATURE TRANSDUCER

Michael P. Timko, and Adrian P. Brokaw, both of Burlington, Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Filed Jul. 6, 1976, Ser. No. 703,087
Int. Cl.[2] G05F 1/58; H01L 19/00
U.S. Cl. 323—1 **36 Claims**



1. In a two terminal transducer for generating an output current through said two terminals varying linearly with absolute temperature by circuit means operable wholly by the current flow through said two terminals, said circuit means comprising first and second transistors having conductive areas of predetermined sizes, means connected to the collectors of the first and second transistors to supply current therethrough, means for controlling the current supplying means to control the currents through the first and second transistors to operate them at different current densities, thereby to produce different base to emitter voltages in the first and second transistors, and means responsive to the difference in the base to emitter voltages of the first and second transistors for developing currents therethrough corresponding to the difference in base to emitter voltages, the improved means for controlling currents through the first and second transistors comprising:

transistor means connected to compare the currents flowing through the first and second transistors and to control the current supply means, said transistor means carrying bias current;

means for generating a controlled current varying linearly with absolute temperature to be combined with the currents through the first and second transistors to form an output current flowing through said two terminals; and

means for directing the bias current in the transistor control means through the controlled current means to compel the bias current to become a component of the controlled output current;

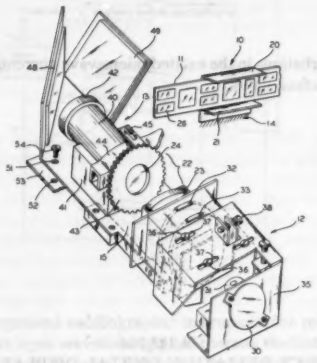
whereby the bias current through the transistor control means does not erroneously affect the output current.

4,123,699

VERTICALLY SCANNING MICROFILM READER AND READER PRINTER

Thomas J. Persha, Juneau, and David Jagielski, West Bend, both of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 675,656, Apr. 12, 1976, abandoned.
This application Sep. 23, 1977, Ser. No. 836,207
Int. Cl.[2] G03B 23/12, 1/48, 21/14
U.S. Cl. 353—26 R 3 Claims



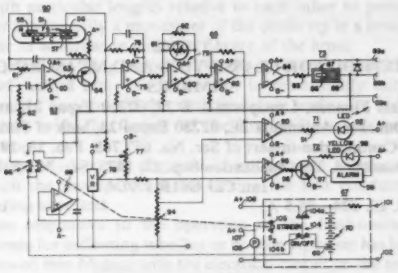
1. A microfilm reader or microfilm reader-printer for vertically scanning, without having to continuously refocus, across a strip of film in which frames are successively recorded in longitudinal orientation along the length of the film, said reader or reader-printer comprising a chassis; a stationary and vertical with respect to gravity microfilm gate anchored to said chassis, means for supporting said strip of film for transport through said gate while said film is in a vertical orientation, said film gate being shaped and dimensioned to present said successive frames, one at a time; a complete optical system floatingly mounted to move together as a single rigid unit, said complete optical system comprising light system means mounted on one side of said gate and an optical projecting lens and focusing system mounted on the other side of said gate, said focusing system having a telescoping barrel which gives a range of lens travel for focusing and maintaining a focused lens position, said means for mounting said complete optical system including rigid base means for commonly supporting said light system, focusing barrel, lens and focusing system, said base being horizontally-oriented with respect to gravity; elevator means for raising and lowering said base member, relative to said chassis, to raise and lower as a rigid unit at least said floating light, lens barrel, lens, and focusing systems without changing the focus of said telescoping barrel and lens, said elevator means comprising a vertical telescoping shaft with one telescoping part fixed on said chassis and a second telescoping part fixed horizontally on said rigid base means, a height adjusting shaft having opposite ends with an eccentric pin at one end and a means to rotate the opposite end, a horizontally disposed rectangular slot on said second telescoping part which receives said eccentric pin, whereby rotating the adjusting shaft causes the eccentric pin to move within the horizontal slot and raises or lowers the second telescoping part and the image on the film in the vertical gate may be scanned in one dimension transverse to the width of the film, without requiring a refocusing of said telescoping barrel.

4,123,700

POTENTIOSTATED, SELF-HUMIDIFYING, SOLID POLYMER ELECTROLYTE CARBON MONOXIDE DOSIMETER

Anthony B. LaConti, Lynnfield; Robert A. Torkildsen, Danvers, and Robert C. Jones, Wakefield, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Nov. 14, 1977, Ser. No. 851,129
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—29 15 Claims



1. A gas dosage instrumentality for measuring the total quantity of a selected gas comprising the combination of;

(a) a gas-sensing cell for electrochemically converting the selected gas to produce an electrical signal directly related to the concentration of the selected gas,

(b) means for bringing gaseous samples to said sensing cell,

(c) means for measuring the total quantity of the selected gas sensed by said cell, including

(1) a reversible, electrochemical integrating device for continuously storing the signals from said cell to provide a measure of the accumulated quantity of the selected gas,

(2) means coupled to said integrating device for selectively applying an electrical resetting signal thereto for readout of the stored information and to reset the integrating device,

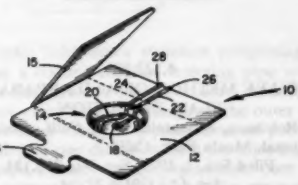
(3) means responsive to said resetting signal for measuring and indicating the accumulated dosage.

4,123,701

DISPOSABLE SAMPLE CARD HAVING A WELL WITH ELECTRODES FOR TESTING A LIQUID SAMPLE

Turi L. H. Josefsen, New York, N.Y., and George J. Veth, Fairfield, Conn., assignors to United States Surgical Corporation, Stamford, Conn.

Filed Jul. 1, 1976, Ser. No. 701,885
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—30 B 21 Claims



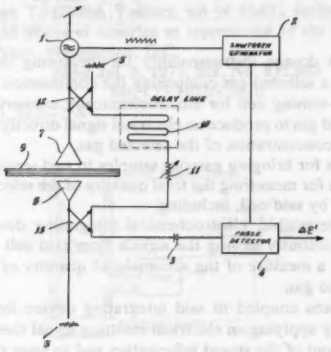
1. A sample card for electrically operating on a liquid sample, the card comprising: a substantially planar base portion; a well portion extending out of said base portion so as to leave a substantially planar region completely surrounding said well portion; first electrode means in said well portion; second electrode means in said well portion, spaced and insulated from said first electrode means; first and second electrical leads

electrically integral with said first and second electrode means, respectively, and connector means electrically integral with each of said first and second electrical leads, wherein said first electrode means is a button electrode located in the central region of said well portion; and wherein said second electrode means is a ring electrode extending substantially entirely around said first electrode means.

4,123,702
METHOD FOR CLASSIFYING AND MEASURING OF TIMBERS

Ilmari Kinanen, Lansiportti 1 E 27, 02210 Espoo 21, and Jim Duncker, Anjankuja 2E, 02230 Espoo 23, both of Finland

Continuation-in-part of Ser. No. 657,768, Feb. 13, 1976, abandoned. This application Sep. 22, 1977, Ser. No. 835,575
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 A **1 Claim**



1. A method for sorting out and classifying timber in terms of knots characterized in that frequency modulated radio energy in the microwave range is applied from at least one transmitting antenna to one side of the lumber, which is passed in front of the antenna; on the other side of the lumber is a receiving antenna; a portion of the frequency modulated signal applied to the lumber is delayed so that at operating frequency the phase of this reference signal is, opposite to the phase of signal coupled through the receiving antenna, the change of frequency at which the sum of the two detected signals is at minimum is a measure of the phase shift caused by the knot.

4,123,703
MICROWAVE METHOD OF AND APPARATUS FOR FLAW DETECTION

Lloyd A. Robinson, Mountain View, Calif., assignor to SRI International, Menlo Park, Calif.

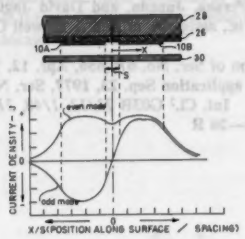
Filed Sep. 2, 1977, Ser. No. 830,151
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 B **13 Claims**

1. Apparatus for detecting flaws at the surface of a test object comprising,

a pair of parallel strip transmission lines,

means for coupling said strip transmission lines to a microwave source for signal propagation therealong of one mode to excite microwave currents on the surface of the test object, and

means coupled to said strip transmission lines for detection of signals of an orthogonal mode produced as a result of

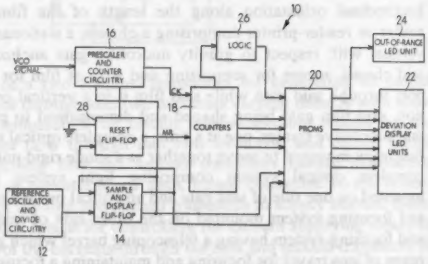


perturbations in the excited microwave currents produced by surface flaws.

4,123,704
FREQUENCY DEVIATION DIGITAL DISPLAY CIRCUIT

Kenneth C. Johnson, Bountiful, Utah, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 30, 1978, Ser. No. 873,449
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 Z **9 Claims**



1. A circuit for producing a digital display of the deviation of the actual frequency of an input signal from a preselected desired frequency, comprising:

means for producing alternating sampling and display period pulses;

means for receiving said input signal and said sampling and display pulses and producing, during the period of a sampling pulse, clock pulses at a rate proportional to the actual frequency of said incoming signal;

counter means for receiving said clock pulses and counting the number thereof produced during the period of a sampling pulse, said counter means being operable to hold said count during the period of a display pulse succeeding said sampling pulse;

digital display means; and

means for sensing the count held by said counter means and decoding the same to drive said display means to digitally indicate, when within a predetermined range, the magnitude of deviation of the actual frequency of said incoming signal from the preselected desired frequency.

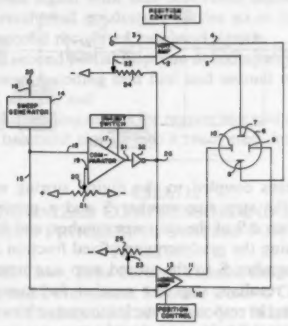
4,123,705
OSCILLOGRAPHIC APPARATUS FOR MEASURING THE MAGNITUDE AND DURATION AND FOR SEPARATELY VIEWING AN INPUT SIGNAL

Ronald Arthur Olson, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 634,818, Nov. 24, 1975, abandoned, which is a continuation of Ser. No. 503,199, Sep. 4, 1974, abandoned. This application Jun. 8, 1977, Ser. No. 804,827

Int. Cl.[2] G01R *13/20;* **H01J** *29/70*

U.S. Cl. 324—121 R **4 Claims**



1. An improved oscillographic instrument for providing a display of an input waveform applied thereto, the instrument of the type which includes deflection means for generating a deflection signal in accordance with the instantaneous amplitude of the input waveform for determining the amplitude of the display and for generating a deflection signal for providing a time base sweep, and also including electric means for causing substantially instantaneous amplitude changes in the deflection signals produced by the deflection means, the improvement comprising:

means for selectively comparing the time base sweep to a reference value for providing calibrated electrical values for application to the electric means whereby the instrument will provide a display of recurring and non-recurring input waveforms applied thereto.

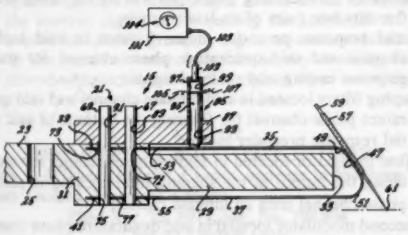
4,123,706
PROBE CONSTRUCTION

Jacques L. Roch, San Jose, Calif., assignor to Electroglas, Inc., Santa Clara, Calif.

Continuation of Ser. No. 554,645, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,844, Jan. 28, 1974, Pat. No. 3,939,414. This application Jan. 11, 1977, Ser. No. 758,393

Int. Cl.[2] G01R *1/06, 31/02*

U.S. Cl. 324—158 P **26 Claims**



1. A probe for testing an electrical circuit on a semiconductor surface comprising:

a dielectric support body having first and second opposite ends;

a first conductive spring arm having a length defined by an inner end and an outer end;

a second conductive spring arm having a length defined by an inner end and an outer end;

a conductive probe tip having a point;

the first and second spring arms being connected to the support member at their inner ends for flexure relative to each other and for flexure of the second arm in accordance with the flexure of the first arm and being provided with particular lengths relative to each other to provide for substantially a movement of the probe tip in a straight line in accordance with the flexure of the arms;

said probe tip being supported by the outer ends of said first and second arms for movement in substantially only a straight line toward the semiconductor surface in accordance with the flexure of the first and second spring means;

fluid-operated means disposed in cooperative relationship with the flexing means for flexing the first conductive spring arm; and

means responsive to the operation of the fluid-operated means for indicating whether or not the probe tip has been moved into contact with the electrical circuit on the semiconductor surface.

4,123,707
MAGNETIC FIELD SENSOR HOUSED IN A COOLING DEVICE FOR SENSING THE CHARGE IN A SHAFT FURNACE OR THE LIKE

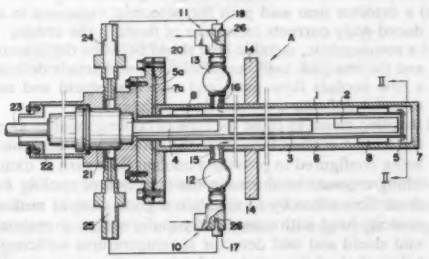
Yoshihiro Fujii; Taketoshi Moriyama, both of Sakai; Yoshikatsu Shigematsu, Kawachi-Nagano; Shinjiro Takeuchi, Toda; Toshiro Kikuchi, Toda; Makio Taguchi, Toda, and Satoshi Ichioka, Toda, all of Japan, assignors to Nippon Steel Corporation, Tokyo and Mishima Kosan Co., Ltd., Kitakyushu, both of, Japan

Filed Nov. 9, 1976, Ser. No. 739,861

Claims priority, application Japan, Nov. 11, 1975, 50-153383[U]

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—208 **4 Claims**



1. A magnetic field sensor structure comprising an outer casing having a cooling medium injecting pipe with a flow control valve therein and a cooling medium exhaust pipe with a flow control valve therein, a flange on the outer peripheral surface of the outer casing at a predetermined position along the outer casing in one direction from the injecting pipe and the exhaust pipe, a sensor comprising an inner core body consisting of a permanent magnet exciter for magnetizing and exciting a charge in a shaft furnace or the like, a magnetic field sensing member positioned along the inner core body adjacent one end of the exciter for detecting the exciting magnetic field generated from said exciter the magnetic field sensing member being on the same side of the exciter as the flange is positioned in relation to the pipes, and a driving circuit positioned along the inner core body adjacent the other end of the exciter for driving said magnetic field sensing member, and an inner cas-

ing in which the inner core body is contained, said inner casing being positioned in said outer casing and spaced from the interior surface of said outer casing for providing a space for circulating a cooling medium through the space to cool the inner core body.

4,123,708

METHOD AND APPARATUS FOR EDDY CURRENT INSPECTION OF HOT TEST PIECES WITH MEANS TO COOL THE DETECTOR AND TO PURGE THE TEST PATH OF CONTAMINANTS

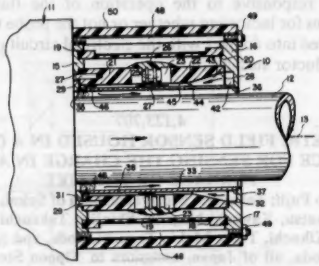
Joseph P. Vild, Lyndhurst; William I. Cleary, Youngstown, and Donald P. Fox, Cleveland, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 471,183, May 20, 1974, Pat. No. 4,024,470. This application Nov. 22, 1976, Ser. No. 744,111

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—224 **16 Claims**



1. In an eddy current flaw inspection apparatus including structure defining a test path and means to move a detection assembly and a high temperature article to be inspected relative to each other, the improved detection assembly comprising:

(a) exciter means positioned near said test path for inducing eddy currents in an article being inspected;

(b) a detector near said path for detecting variations in induced eddy currents indicative of flaws in the article;

(c) a nonmagnetic, metallic heat shield between the detector and the test path, said heat shield and said article defining a first coolant flow path, and said heat shield and said detector defining a second flow path; and

(d) cooling means to cause the flow of cooling medium along the second coolant flow path, the detector and heat shield being configured to provide a coolant flow path of diminishing cros-sectional area in the direction of cooling medium flow whereby to maintain a good coolant medium velocity head with substantially uniform flow to maintain said shield and said detector at temperatures sufficiently below that of the article under inspection to assure substantially uniform detection performance substantially free of aberrations or variances due to excessive detector temperature levels.

4,123,709

ADAPTIVE DIGITAL DELTA MODULATION FOR VOICE TRANSMISSION

David E. Dodds; Andrzej M. Sendyk, both of Saskatoon, and Donald B. Wohlberg, Richmond, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 24, 1977, Ser. No. 762,436

Int. Cl.[2] H03K *13/22*

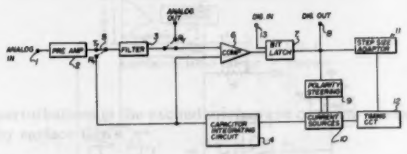
U.S. Cl. 325—38 B **8 Claims**

1. In an adaptive delta modulation system wherein an analog signal is represented by a stream of signal binary bits each occupying a fixed time period, apparatus for converting the stream of signal binary bits to an analog output signal comprising:

integrator means for receiving a charge to provide the analog output signal;

first means for increasing or decreasing the charge on the integrator means by a variable step size S during each of fixed time periods in response to successive signal binary bits, the increase and decrease of the charge being determined by the logic level of the binary bits;

digital means for storing the step size number S; and



summing means coupled to the digital storing means for receiving the step size number S and a predetermined fixed fraction ΔS of the step size number, and for adding or subtracting the predetermined fixed fraction ΔS of the step size number S to the stored step size number S to produce a resultant step size number for storage in the digital means in response to each successive binary bit, the fixed fraction ΔS being added to the step size number S in response to successive similar binary bits and the fixed fraction ΔS being subtracted from the step size number S in response to successive dissimilar bits.

4,123,710

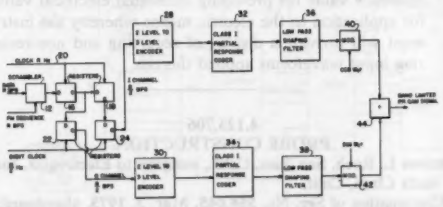
PARTIAL RESPONSE QAM MODEM

Richard L. Stuart, Simpsonville, Md., and Arvind M. Bhopale, Placentia, Calif., assignors to Rixon, Inc., Silver Spring, Md.

Continuation of Ser. No. 736,581, Oct. 28, 1976, abandoned. This application Nov. 30, 1977, Ser. No. 856,072

Int. Cl.[2] H04L *3/00*

U.S. Cl. 325—38 A **6 Claims**



1. A partial response QAM data transmission system comprising:

transmitter means having

means located in an inphase channel and a quadrature phase channel for receiving data input and for encoding sets of five bits into pairs of six-level signals;

partial response precoder means located in said inphase channel and said quadrature phase channel for partial response coding said six-level signals;

shaping filters located in said inphase channel and said quadrature phase channel for filtering the outputs of said partial response precoder means;

a first modulator located in said inphase channel for modulating the output of the shaping filter located in said inphase channel with an inphase carrier;

a second modulator located in said quadrature phase channel for modulating the output of the shaping filter located in said quadrature phase channel with a quadrature phase carrier;

summing means for summing the outputs of said first and

second filters to produce a partial response coded QAM signal;

receiver means, for receiving the partial response coded QAM signal transmitted by said transmitter means, having automatic equalizer means for receiving said transmitted signal and producing a phase equalized received signal in response thereto;

carrier recovery means for recovering the transmitted carrier and for generating a recovered inphase carrier and a recovered quadrature phase carrier;

first and second demodulator means for demodulating the received signal with said recovered inphase carrier and said recovered quadrature carrier so as to produce first and second recovered baseband signals;

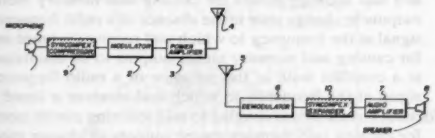
first and second partial response decoding circuits for partial response decoding said first and second recovered baseband signals; and

six-level decoding means for converting said decoded recovered baseband signals into a recovered date input.

4,123,711
SYNCHRONIZED COMPRESSOR AND EXPANDER VOICE PROCESSING SYSTEM FOR RADIO TELEPHONE

Sherman M. Chow, Bells Corners, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 24, 1977, Ser. No. 762,435
Int. Cl.² H04B *1/64*; H03G *7/00*
U.S. Cl. 325—62 **11 Claims**



1. A voice processing system for radio telephones having an amplitude modulating signal transmitter and receiver, comprising:

compressor means for adjusting the input voice signal to be transmitted by the transmitter, said compressor means including means for receiving and dividing the input voice signal into sequential syllabic groups of equal length M, means for detecting the peak amplitude of each sequential syllabic group and adjusting the amplitude of the corresponding syllabic group by a gain adjustment determined by the detected peak amplitude, and means for providing a control signal representative of the sequential gain adjustments for transmission with the adjusted voice signal; and

expander means for restoring the adjusted voice signal from the transmitted signals received by the receiver, said expander means including means for receiving and dividing the received adjusted voice signal into the sequential syllabic groups of equal length M and means for receiving the control signal and adjusting the amplitude of each sequential syllabic group by a gain adjustment determined by the received control signal, thereby restoring the received adjusted signal to the original input voice signal.

4,123,712
SYMMETRICAL POLYPHASE NETWORK

Wasfy B. Mikhaël, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

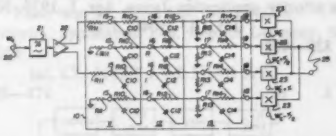
Filed Apr. 22, 1977, Ser. No. 789,804
Int. Cl.² H04B *1/02*
U.S. Cl. 325—137 **8 Claims**

1. In a symmetrical polyphase network having a plurality of symmetrical sections each comprising:

an input and an output;

a first impedance having one phase angle, connected between the input and output of an associated one of said sections,

a second impedance having a different phase angle, con-



nected between the input of said associated one section and the output of a different section;

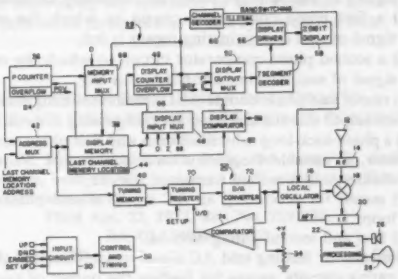
the improvement comprising:

a third impedance in each of said sections connected in shunt with said output to decrease the passband ripple with negligible effect on the stopband response of the network.

4,123,713
MEMORY TYPE TUNING SYSTEM WITH PROVISIONS TO FACILITATE SETUP

Charles M. Wine, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 28, 1977, Ser. No. 810,877
Int. Cl.² H04B *1/26*
U.S. Cl. 325—455 **11 Claims**



1. An apparatus for tuning a receiver to a predetermined number of preferred tuning positions less than all the tuning positions available in a predetermined tuning range, comprising:

memory means including a number, equal to said predetermined number of preferred tuning positions, of memory locations for storing binary signals;

control means for selectively entering binary signals into one of said memory locations during an entry control mode and retrieving binary signals from one of said memory locations during a retrieval control mode;

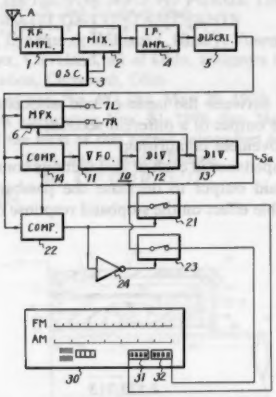
means for examining the binary signals contained in each of said memory locations and generating a fail signal during one of said control modes when each of said memory locations contains binary signals representing infomation of a predetermined kind and that said memory means is in a predetermined condition;

display means responsive to said fail signal for displaying a predetermined symbol representing said predetermined condition.

4,123,714
FM RECEIVER WITH LIQUID CRYSTAL SIGNAL INDICATOR

Mitsuo Ohsawa, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,394
Claims priority, application Japan, Apr. 1, 1975, 50-40148
Int. Cl.[2] H04H 5/00
U.S. Cl. 325—455 4 Claims



1. An FM receiver comprising:

(a) means for receiving both stereo broadcast signals and monaural broadcast signals and for discrminating signals of a selected broadcast frequency channel;

(b) means for detecting whether a pilot signal indicating the existence of a stereo signal is present in said discriminated signals of said selected broadcast frequency channel;

(c) a first phase comparator circuit to which the output signal of said discriminating means is fed;

(d) a second phase comparator circuit to which the output signal of said discriminating means is fed;

(e) one of said phase comparator circuits including means on its output side for inverting a signal passing therethrough;

(f) a phase-lock-loop which includes said first phase comparator, a variable frequency oscillator, a first frequency divider, and a second frequency divider;

(g) means for producing an AC signal in said phase-lock-loop;

(h) first and second gating circuits;

(i) means for feeding said AC signal to said first and second gating circuits, means for feeding the output of said second comparator circuit to said first gating circuit, and means for feeding the inverted output of said second comparator circuit to said second gating circuit;

(j) one of said gating circuits being in an ON state, and one being in an OFF state when a broadcast signal is being received; and

(k) a liquid crystal display means connected to said gating circuits for displaying a stereo indicating sign when one of said gating circuits is ON and for displaying a monaural indicating sign when the other of said gating circuits is ON.

4,123,715
PROGRAM APPARATUS FOR RADIO RECEIVER USING FREQUENCY SYNTHESIZER

George H. Fathauer, Mesa, Ariz., assignor to Masco Corporation of Indiana, Cumberland, Ind.

Filed Jan. 30, 1975, Ser. No. 545,433
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—464 31 Claims

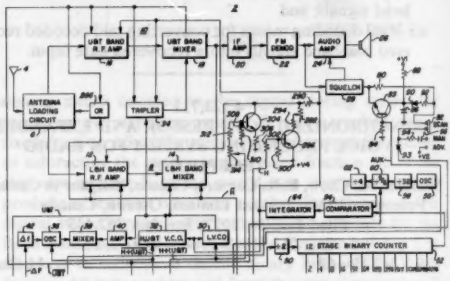
1. A scanning, superheterodyne radio receiver capable of sequentially tuning to a plurality of predetermined radio frequencies and comprising:

frequency synthesizing circuitry for generating a local oscillator signal and including a programmable frequency divider circuit;

memory means having a plurality of outputs coupled to said frequency divider circuit, said memory means outputs being capable of assuming a plurality of discrete states corresponding to a plurality of words stored in said memory and operable to control the frequency to which said receiver is tuned;

squelch circuit means for generating a signal responsive to the presence of a radio frequency signal at the frequency to which said receiver is tuned;

scanning circuit means coupled to said squelch circuit means



and said memory means for causing said memory means outputs to change state in the absence of a radio frequency signal at the frequency to which said receiver is tuned and for causing said memory means outputs to be maintained at a constant state in the presence of a radio frequency signal at the frequency to which said receiver is tuned;

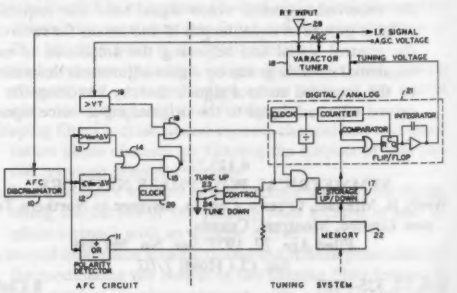
lockout circuit means coupled to said scanning circuit means for causing said memory means outputs to change states despite the presence of a radio frequency signal at the frequency to which said receiver is tuned, said lockout circuit means comprising a plurality of manually operable switches; and

memory program circuit means coupled to said memory means for altering the memory means output states corresponding to said words, said program circuit means comprising said plurality of switches.

4,123,716
AUTOMATIC FREQUENCY CONTROL FOR DIGITAL TUNING SYSTEMS

Arthur N. Borg, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Aug. 12, 1976, Ser. No. 713,731
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—464 8 Claims



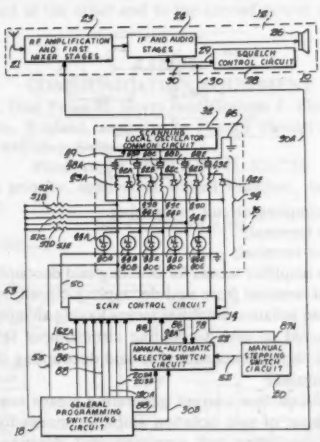
1. In combination, a varactor tuner for providing an interme-

diate frequency signal in response to a radio frequency signal, a tuning system of the type wherein a binary word is used to develop a tuning voltage for selecting the tuning frequency of said varactor tuner, an automatic frequency control apparatus comprising a frequency discriminator for providing a signal indicative of the direction of a tuning error in response to said intermediate frequency signal, and means for modifying said binary word in response to said discriminator signal to minimize said tuning error.

4,123,717
SCANNING RECEIVER HAVING PRIORITY CHANNEL INDICATION IN MEMORY

Joseph T. Yiu, Lincoln, and Roy L. Holmes, Lexington, both of Nebr., assignors to Hy-Gain De Puerto Rico, Inc., Lincoln, Nebr.

Filed Jul. 14, 1977, Ser. No. 815,712
Int. Cl.² H04B 1/32
U.S. Cl. 325—470 **13 Claims**

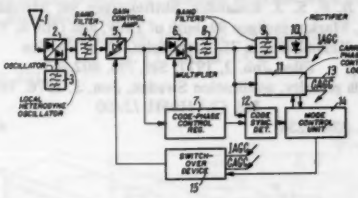

RF AMPLIFICATION AND FIRST MIXER STAGES
IF AND AUDIO STAGES
SQUELCH CONTROL CIRCUIT
LOCAL OSCILLATOR COMMON CIRCUIT
SCAN CONTROL CIRCUIT
ANNUAL-AUTOMATIC SELECTOR SWITCH CIRCUIT
MANUAL STEPPING SWITCH CIRCUIT
GENERAL PROGRAMMING SWITCHING CIRCUIT

1. A signal seeking radio receiver comprising:
means for receiving radio signals on a plurality of different channels;
means for automatically changing from channel to channel;
said means for changing from channel to channel including sequencing means for changing from channel to channel in a predetermined sequence and means for locking on a selected channel when a radio frequency signal is received on said channel;
said means for sequencing further including programmable means including memory means for storing an indication of a priority channel, means for writing said indication in said memory and memory addressing means for selecting said indication;
said means for addressing said memory including means for selecting said indication in accordance with the channel selected by the sequencing means; and
said programming means including means for interrogating the channel indicated as the priority channel in said memory means and means for locking on priority channel when a signal is received thereon even though it is not in said predetermined sequence.

4,123,718
SSMA RECEIVER WITH SYNCHRONOUS DEMODULATION AND VARIABLE GAIN CONTROL

Ernst Lampert, Unterpfaffenhofen, and Helmut Mahner, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 27, 1971, Ser. No. 184,238
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1970, 2048056
Int. Cl.² H03D 3/18; H04B 1/10
U.S. Cl. 325—474 **5 Claims**

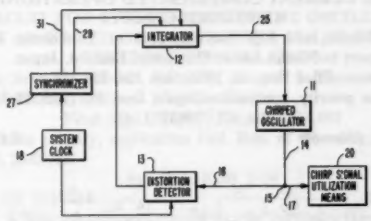


1. A receiver for electric oscillations modulated in accordance with SSMA transmission techniques, comprising
a multiplier for multiplying an intermediate frequency signal with a code which is to be received;
a synchronous demodulator for obtaining the information to be received connected to said multiplier;
a control amplifier connected to and preceding said multiplier;
a first gain control derivation circuit connected between said multiplier and said control amplifier for controlling the operation of said amplifier in an unsynchronized state of said synchronous demodulator; and
a second gain control derivation circuit connected between said synchronous demodulator and said control amplifier for controlling the operation of said amplifier when said synchronous demodulator is in a synchronized state.

4,123,719
CHIRP PHASE DISTORTION DETECTOR IN A WIDEBAND LINEARIZATION FEEDBACK CONTROL LOOP

Francis W. Hopwood, Severna Park, and Lester K. Staley, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 22, 1977, Ser. No. 789,906
Int. Cl.² H03K 13/32
U.S. Cl. 328—155 **5 Claims**



1. In a system having a clock and utilizing means to generate a pulsed linearly frequency modulated waveform, a phase distortion detector comprising:
a signal generating means responsive to said clock for producing a first signal having a first predetermined frequency along a first signal path and a second signal having a second predetermined frequency less than said first predetermined frequency along a second signal path;
a phase comparison means connected to and responsive to said first and second signals and to said frequency modu-

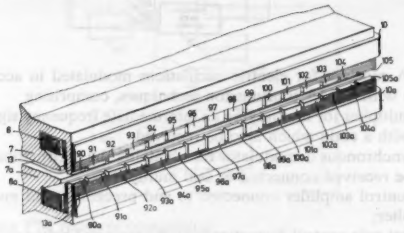
lated waveform for producing a third signal proportional to the non-linearity of said frequency modulated waveform; p1 means for applying said third signal to said means to generate a pulsed linearly frequency modulated waveform.

4,123,720

METHOD AND APPARATUS FOR COMPENSATON OF EFFECTS OF MISALIGNMENT BETWEEN DEFLECTING MAGNETIC FIELDS AND A LINEAR ACCELERATOR IN A RACE TRACK MICROTRON

Staffan B. F. S. J. Rosander, Skiftesvägen 98; Miroslav Sedlacek, Marknadsvägen 99, both of Täby, and Olle S. V. Wernholm, Ralambsvägen 21, Stockholm, all of Sweden

Filed Jun. 2, 1977, Ser. No. 802,863
Claims priority, application Sweden, Jun. 3, 1976, 7606321
Int. Cl.[2] H05H *13/00*
U.S. Cl. 328—234 **4 Claims**



1. A method for compensating for the effects of misalignment between deflecting magnetic fields and a linear accelerator in a race track microtron where properly injected and accelerated electrons travel along successive complete orbits numbered in sequence comprising the steps of:

generating on both sides of the linear accelerator a compensating magnetic field perpendicular to the common plane of the orbits, each field intersecting all complete successive orbits and having a field strength in the regions of the intersections varying stepwise from intersection to intersection; and

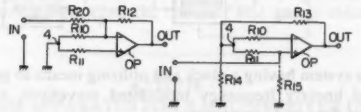
simultaneously varying the field strength at the intersections while maintaining a linear relationship between the field strength at an intersection and the number of the intersecting complete orbit.

4,123,721

BIAS CURRENT COMPENSATED OPERATIONAL AMPLIFIER CIRCUIT

Akio Hosaka, and Eiji Tsuruta, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Dec. 20, 1976, Ser. No. 752,181
Claims priority, application Japan, Dec. 27, 1975, 51-155773
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—69 **8 Claims**



1. Operational amplifier circuitry comprising:

first and second input terminals for receiving an input signal, said second input terminal being connected to ground;

an operational amplifier having first and second input terminals and an output terminal, means connecting one of said first and second input terminals of said operational amplifier for said operational amplifier to receive said input signal from said first input terminal;

a junction;

means for determining a predetermined electric potential of said junction relative to ground; and

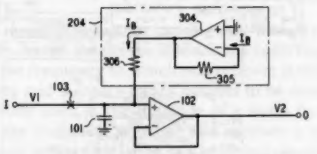
first and second resistors each respectively having first and second terminals, said first terminal of said first resistor being connected to said first input terminal of said operational amplifier, said first terminal of said second resistor being connected to said second input terminal of said operational amplifier, said second terminals of said first and second resistors being connected to said junction, the value of the resistances of said first and second resistors being selected and fixed to develop a voltage difference between said first and second input terminals of said operational amplifier substantially equal to the offset voltage of said operational amplifier, thereby compensating for bias currents of said operational amplifier.

4,123,722

OPERATIONAL AMPLIFIER DECOUPLING CIRCUIT

Richard J. Cubbison, Jr., Littleton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 9, 1977, Ser. No. 804,877
Int. Cl.[2] H03F *1/08*
U.S. Cl. 330—85 **8 Claims**



1. A decoupling circuit comprising:

an input terminal;

an output terminal;

isolation amplifier means for isolating said decoupling circuit output terminal from said decoupling circuit input terminal, said isolation amplifier means having an input terminal connected to said decoupling circuit input terminal, an output terminal connected to said decoupling circuit output terminal;

active circuit bias current generating means connected to said input of said isolation amplifier means for dynamically generating and supplying said isolation amplifier means with dc input bias current;

wherein said bias current generating means comprises a first operational amplifier of a matched pair of operational amplifiers, and said isolation amplifier means comprises a second operational amplifier of said matched pair of operational amplifiers; and

wherein said active circuit bias current generating means senses its own dc input bias current to generate said isolation amplifier means dc input bias current.

4,123,723

TRANSISTOR AMPLIFIER CIRCUIT

Tsutomu Sugawara, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 7, 1977, Ser. No. 813,467
Claims priority, application Japan, Jul. 9, 1976, 51-81741
Int. Cl.[2] H03F *3/04*
U.S. Cl. 330—311 **5 Claims**

1. A transistor amplifier circuit comprising:

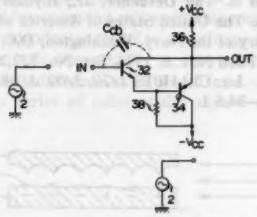
a first and a second power sources of which the polarities are opposite to each other;

an input terminal;

a first output terminal;

a first transistor which is connected at the base to said input terminal and at the collector to said first output terminal;

a second transistor related to said first transistor in complementary fashion, which said second transistor is connected at the base to the emitter of said first transistor and at the collector to said first power source and at the emitter to said first output terminal;



first resistive means which is connected at one end to the emitter of said first transistor and at the other end to said first power source;

second resistive means having much smaller resistance than that of said first resistive means, which said second resistive means is connected at one end to the connection point of the collector of said first transistor, the emitter of said second transistor and said first output terminal, and connected at the other end to the second power source.

4,123,724
COMMUNICATION EQUIPMENT

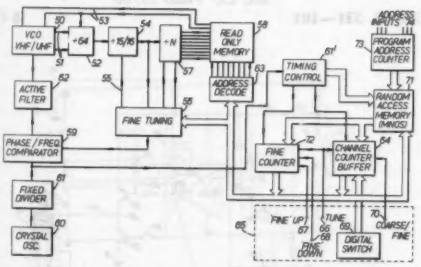
Tapan K. Das; Peter H. Boyce, and Graham J. Fletcher, all of Swindon, England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Aug. 1, 1977, Ser. No. 820,731

Claims priority, application United Kingdom, Aug. 4, 1976, 32419/76

Int. Cl.² H03B 3/04

U.S. Cl. 331—1 A **32 Claims**



1. A frequency synthesis control system for communications equipment including a variable frequency oscillator the frequency of which is changed to effect channel or frequency tuning of said equipment, the control system comprising,

first divider means for dividing the output of the variable frequency oscillator by a first division ratio or a second division ratio under the control of a fine tune control signal applied to said first divider means, the output of said first divider means being a first divided signal,

variable frequency divider means for dividing said first divided signal, the division ratio of which is selected in accordance with a required channel or frequency of said equipment, the output of said variable divider means being a second divided signal,

reference frequency generator means for generating a reference frequency signal, and

comparator means for comparing the second divided signal and the reference frequency signal and for producing a control signal which is fed to the variable frequency oscillator for controlling its frequency,

fine tuning means being provided for applying the fine tuning control signal to the first divider means and for applying a further fine tuning control signal to the variable frequency divider means whereby the division ratios of both divider means are changed for effecting fine tuning of the variable frequency oscillator.

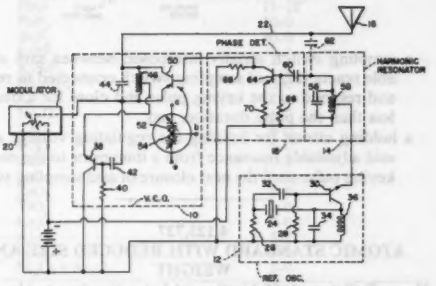
4,123,725
PHASE LOCKED LOOP SYSTEM

Manfred Davis, Bronx, N.Y., assignor to Transcience Industries, Inc., Stamford, Conn.

Filed Apr. 18, 1977, Ser. No. 788,377

Int. Cl.² H03B 3/04

U.S. Cl. 331—8 **16 Claims**



1. Apparatus for generating a control signal representing deviations from a certain frequency of a signal from a source which comprises

circuit means resonant at a frequency which differs slightly from said certain frequency,

means for applying signals having a frequency which is the product of $1/n$ and said certain frequency, where n is an integer, to said circuit means,

phase detector means responsive to the signal from said source and having an input and an output, said input being coupled to said circuit means and to said source such that the signals from both said circuit means and said source are applied together to said input for phase detection and for providing said control signal at said output.

4,123,726
CIRCUIT FOR SYNCHRONIZING THE OSCILLATION OF AN OSCILLATOR KEYED BY A PULSE, WITH A REFERENCE OSCILLATION

Peter Schucht, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 15, 1977, Ser. No. 833,488

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1976, 2648796

Int. Cl.² H03B 3/04

U.S. Cl. 331—14 **12 Claims**

1. A synchronization circuit for an oscillator keyed by a keying pulse, with a low amplitude reference oscillation which is input coupled to the oscillator, comprising:

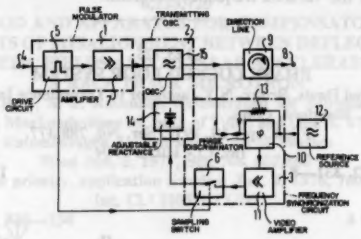
a phase regulating loop including a phase discriminator connected to receive the output oscillations of the oscillator and the reference oscillation and to compare the phase states thereof and produce a resultant regulating voltage, said phase discriminator including a high impedance output;

an adjustable reactance connected to the oscillator and to said phase discriminator for controlling the output fre-

quency of the oscillator in accordance with said regulating voltage;

a phase shift device which is adjustable up to 180° connected between the oscillator and said phase discriminator;

an impedance converter connecting said high impedance output of said phase discriminator in a low impedance fashion to said adjustable reactance;



a sampling switch serially interposed between said adjustable reactance, said sampling switch connected to receive and respond to the keying pulse and close for a duration less than the pulse duration; and

a holding circuit for holding the regulating voltage across said adjustable reactance from a time prior to the end of a keying pulse until the next closure of said sampling switch.

4,123,727

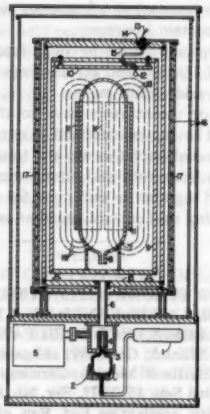
ATOMIC STANDARD WITH REDUCED SIZE AND WEIGHT

Harry E. Peters, 1675 Northwood Lake, Northport, Ala. 35476

Filed Jan. 19, 1978, Ser. No. 871,088

Int. Cl.[2] H01S *1/06*

U.S. Cl. 331—94 **6 Claims**



1. An improved atomic or molecular frequency standard device utilizing the storage of atoms or molecules for periods of time within a defined storage region of space inside a microwave cavity, wherein the improvement comprises:

a. At least one electrode about and juxtapositioned to said storage region and within said microwave cavity;

b. Said electrodes so configured and placed to enhance, concentrate, and orient the oscillating magnetic field in the storage region;

c. Said electrodes being arrayed generally circumferentially around said storage region and in a surface of revolution about the axis of the atomic or molecular beam;

d. Said electrodes, storage region and microwave cavity so proportioned to be tuned for operation at approximately the atomic or molecular quantum transition frequency of the atoms or molecules used.

4,123,728

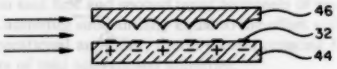
ELECTROGENERATED CHEMILUMINESCENT (ECL) LASER

James L. Jernigan, Inyokern; Richard S. Hughes, China Lake, and Russell R. Van Devender, Jr., Inyokern, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1976, Ser. No. 737,238

Int. Cl.[2] H01S *3/20, 3/09, 3/081*

U.S. Cl. 331—94.5 L **6 Claims**



1. An electrogenerated chemiluminescent laser comprising:

a lasing solution which comprises an organic dye and a supporting electrolyte mixed with a solvent so as to exhibit the phenomenon of electrogenerated chemiluminescence;

a resonant laser cavity having an output window and containing said lasing solution;

a pair of electrodes, each of which have a plurality of wires attached thereto;

said pair of electrodes forming an interdigitated electrode configuration as a means for electrically stimulating said lasing solutin to produce cations and anions; and

means for hydrodynamically mixing said cations and anions to produce laser action in said laser cavity.

4,123,729

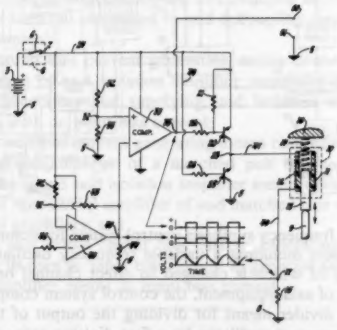
DISPLACEMENT TRANSDUCER

Earl H. Buetemeister, Alexandria, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 22, 1977, Ser. No. 818,006

Int. Cl.[2] F02B *33/00*

U.S. Cl. 331—181 **6 Claims**



1. A circuit for producing a series of substantially square wave output signals of a repetition rate determined by the inductance value of the inductance coil of a variable inductor device comprising in combination with a unidirectional supply potential source: switching means electrically operable in a manner to alternately connect said inductance coil to a charge circuit including said supply potential source and to a discharge circuit; and means for effecting a series of inductance coil charge and discharge cycles at a switching frequency determined by the inductance value of said inductance coil, said last named means including first circuit means responsive to the rise of inductance coil charge current to a selected first

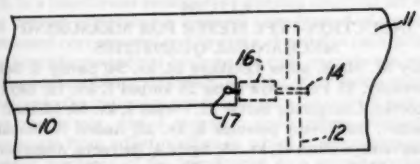
level as determined by a reference voltage of a selected first level for producing a first electrical signal and for reducing said reference voltage to a selected second level and responsive to the fall of inductance coil discharge current to a selected second level as determined by said selected second level of said reference voltage for producing a second electrical signal and for increasing said reference voltage to said selected first level and second circuit means responsive to said first and second electrical signals for operating said switching means in a manner to connect said inductance coil to said charge circuit and to said discharge circuit alternatively at a switching frequency determined by the inductance value of said inductance coil and for producing a series of substantially square wave output signals.

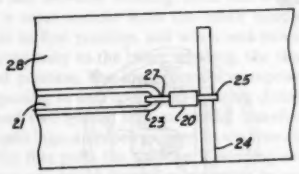
4,123,730

SLOT TRANSMISSION LINE COUPLING TECHNIQUE USING A CAPACITOR

Josef L. Fikart, Port Coquitlam, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Jul. 5, 1977, Ser. No. 812,890
Int. Cl.[2] H01P 3/08, 5/10
U.S. Cl. 333—26 6 Claims





1. Apparatus for coupling a microstrip transmission line to a slot transmission line and for effecting an impedance transformation, said apparatus comprising:

said microstrip transmission line having a characteristic impedance Z_o and capable of propagating a microwave signal having a wavelength λ;

said slot transmission line having a characteristic impedance Z_o, $Z_1 \neq Z_o$, said slot line consisting of a narrow slot in a conductive coating on one side of a dielectric substrate, said slot further having a segment with one end electrically at the same potential as the conductive coating; and

a microwave capacitor having a first lead connected to said microstrip and a second lead connected to said conductive coating, said second lead positioned across and at right angles to said slot transmission line and such that said slot segment extends $N\lambda/4$ beyond the point said second lead crosses said slot line, where N is an odd integer.

4,123,731

GLASS FOR USE IN ULTRASONIC DELAY LINES

Tohru Kanbara; Michihiko Uemura, both of Yokohama, and Nobuhiro Yokoo, Yokosuka, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,259
Claims priority, application Japan, Sep. 21, 1976, 51-112500; Dec. 23, 1976, 51-154229
Int. Cl.[2] H03H 7/30; C03C 3/10, 3/04
U.S. Cl. 333—30 R 12 Claims

1. In a solid ultrasonic delay line comprising an input transducer, a delay medium, and an output transducer, the improvement wherein said delay medium is a glass characterized by a rate of shear wave propagation not exceeding 2.40Km/sec., and which consists essentially of:

	Weight percent
SiO_2	42–27
PbO	71–52
PbF_2	10–0
BaF_2	10–0
KHF_2	9–0
K_2SiF_6	7–0
Na_2SiF_6	5–0
K_2O	12–0
Na_2O	6–0
ZnO	6–0
CdO	6–0
BaO	10–0
SrO	6–0
ZrO_2	5–0
TiO_2	5–0
La_2O_3	7–0
Al_2O_3	5–0
B_2O_3	9–0
$Sb_2O_3 + As_2O_3$	2–0

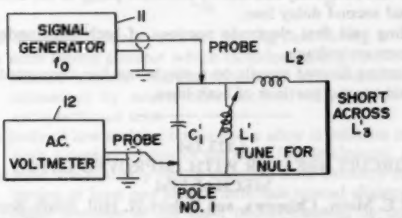
and wherein the composition of the glass includes 1–10 wt.% of $K_2O + Na_2O$.

4,123,732

METHOD OF MAKING TUNED RESONANCE PASSIVE ELECTRONIC FILTERS

Richard A. Daniel, Kingston, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,482
Int. Cl.[2] H03H 7/10, 7/14
U.S. Cl. 333—70 R 4 Claims



1. The method of making a tuned resonance passive electronic filter that includes at least first and second electrically connected poles wherein each pole includes first and second components connected in parallel and adjacent poles are coupled by coupling means comprising the steps of:

(a) selecting each of said first components of said electrically connected poles to be a standard unmatched component that approximates the computed value of that component;

(b) selecting each of said second components of said electrically connected poles to be variable components that have a predetermined variable range on each side of the computed value of that component; and

(c) tuning each of said electrically connected poles separately by applying an a.c. resonant frequency signal to

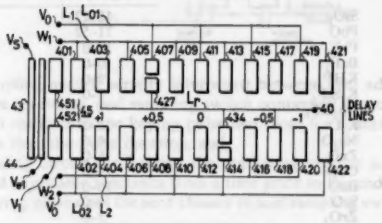
each preselected pole, while shorting adjacent poles, and tuning the variable second component of each preselected pole to resonance as indicated by the null in the a.c. voltage of each preselected pole.

4,123,733

METHOD OF FILTERING ANALOGUE SIGNALS BY TRANSFERRING ELECTRICAL CHARGES IN A SEMICONDUCTOR MEDIUM

Raymond Poirier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 25, 1976, Ser. No. 661,151
Claims priority, application France, Feb. 28, 1975, 75 06252
Int. Cl.[2] H03H *7/28;* H01L *29/10, 27/10;* G11C *27/02*
U.S. Cl. 333—70 T **7 Claims**



1. A method of filtering analogue signals by charge transfer in a semiconductor medium, consisting of:

taking samples of said signals at the rhythm of a first phase of a twophase clock;

introducing them simultaneously into a first and a second charge transfer delay line, each of said lines comprising a first and a second series of electrodes having surfaces, the maximum of which is S, said electrodes of both series being mutually parallel and of a constant pitch, the series being sandwiched, and the electrodes of said second series being divided into a first and a second portions having a total surface equal to S, the surface ratio of said second portion to said surface S representing the proportion of transferred charges to be collected according to a previous calculation, one of said portions being equal to zero as the case may be;

feeding the electrodes of first series by one phase in the case of said first delay line and by the other phase in the case of said second delay line;

feeding said first electrode portions of both lines under a constant voltage;

collecting filtered signals on a single bus bar connected to said second portions of both lines.

4,123,734

CIRCUIT BREAKER WITH IMPROVED LATCH MECHANISM

Alfred E. Maier, Chippewa, and Robert H. Hill, South Beaver Township, Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 6, 1976, Ser. No. 730,107
Int. Cl.[2] H01H *77/06*
U.S. Cl. 335—9 **21 Claims**

1. A circuit interrupter comprising:

a center pole unit and a pair of outside pole units, each of said pole units comprising separable contacts and means for supporting said contacts;

an operating mechanism for moving said contact support means to operate said contacts between open and closed positions, said operating mechanism comprising an arm releasable to effect automatic separation of said contacts;

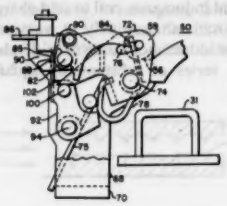
a latch mechanism operable upon actuation to release said arm, said latch mechanism comprising:

a releasable primary latch member cooperating with said arm to maintain said arm in the latched position,

a movable secondary latch member restraining said primary latch member,

means for biasing said secondary latch member toward a position restraining said primary latch member,

a movable trip lever maintaining said secondary latch member in a position restraining said primary latch member, and



a movable trip bar adapted for translational movement and operable when translated to move said trip lever to release said secondary latch member, said primary latch member, and said arm to effect automatic separation of said contacts;

an undervoltage release mechanism operable upon actuation to translate said trip bar; and

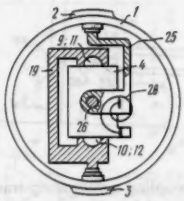
an overcurrent trip mechanism operable upon actuation to translate said trip bar.

4,123,735

INDUCTION-TYPE METER FOR MEASURING MECHANICAL QUANTITIES

Dmitry M. Mash, ulitsa Lenskaya 14, kv. 34; Savely S. Schedrovitsky, 13 Parkovaya ulitsa 25 korpus 1, kv. 12; Zoya I. Golovko, Chengarsky bulvar 22, korpus 2, kv. 50; Mikhail P. Zaitsev, Butikovsky pereulok 5, kv. 25; Andrei N. Sorokin, Festivalnaya ulitsa 41, kv. 43; Agnia A. Belyaeva, Angarskaya ulitsa 29, kv. 9, and Ivan I. Kharitonov, Khlebozavodskoi proezd 8, korpus 2, kv. 149, all of Moscow, U.S.S.R.

Continuation of Ser. No. 553,026, Feb. 25, 1975, abandoned.
This application Feb. 28, 1977, Ser. No. 772,684
Int. Cl.[2] H01F *21/04*
U.S. Cl. 336—30 **2 Claims**



1. An induction-type meter for measuring a controlled mechanical parameter comprising in combination:

a first converter means for converting the controlled mechanical parameter into a displacement; said first converter means having elements capable of relative movement;

a second converter means for converting said displacement into an electric signal and comprising a magnetic circuit with a block of coils and a diagmagnetic screen;

said magnetic circuit embodied as a closed-open loop system comprised of two parallel parts formed by armored cores upon which are mounted said coils and arranged to provide a gap; said magnetic circuit being mounted on one of said elements capable of relative movement of said first converter; and wherein

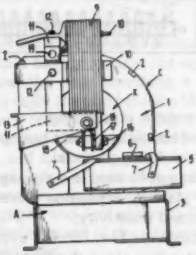
said diamagnetic screen includes profiled working edges and is secured on the other one of said elements capable of relative movement of said first converter and is disposed in said gap; and

said meter further including means for varying an inclination angle of said screen with said direction of movement.

4,123,736
LEAKAGE REACTANCE TRANSFORMER

William K. Brougham, Novar Gardens, Australia, assignor to Welding Industries of Australia Pty. Ltd., Thomastown, Australia

Filed Sep. 23, 1976, Ser. No. 725,733
Claims priority, application Australia, Sep. 23, 1975, 3289/75
Int. Cl.[2] H01F *21/04, 21/06*
U.S. Cl. 336—120 **7 Claims**



1. In a transformer suitable for supplying electrical arc welding current comprising a magnetic core formed of a stack of laminated core material and having a closed flux path, primary and secondary windings having axial ends on said core, one of said windings being stationary and the other being movable relative to the stationary winding to vary the current output of the transformer, and a magnetic shunt means adapted for movement from a first position in which it contributes to the leakage reactance of the transformer, to a second position in which it contributes substantially no leakage reactance, at least that portion of said core between the primary and secondary windings being arcuate and said movable winding being arcuately movable along said portion, said shunt means being movable with said movable winding, such that when said movable winding is most remote from the other winding, said shunt means is in its first position, and when said movable winding is in close proximity to the other winding, the shunt means is in its second position, the improvement comprising a keyhole-shaped opening in said core, said opening defining an arcuate portion and two spaced legs extending therefrom with a gap between said legs, a keeper secured to the free ends of said legs to close the flux path, the stationary winding surrounding one of said legs and being free of penetration by said keeper, the movable winding surrounding said arcuate portion, said magnetic shunt means substantially bridging said gap between said legs when in said first position, wherein most of the surface area of an axial end of the movable winding is in overlapping face-to-face relationship with most of the surface area of an axial end of the stationary winding when the windings are brought into close proximity, and said windings cannot be placed in concentric relationship.

4,123,737
BIMETALLIC CIRCUIT BREAKER

Porter Hoagland, Jr., Noank, Conn., assignor to Heinemann Electric Company, Trenton, N.J.

Filed Nov. 8, 1976, Ser. No. 739,965
Int. Cl.[2] H01H *71/16*
U.S. Cl. 337—68 **9 Claims**

1. A bimetallic circuit breaker comprising

a housing,

a sub-assembly received within said housing and comprising

a body extending within said housing,

first and second terminals carried by said body,

said first terminal including a stationary contact,

said second terminal including a bimetallic blade having a movable contact,

said bimetallic blade being movable on predetermined conditions from a contacts closed position to a contacts tripped position and thereafter to a contacts open position,

an actuator operatively carried by said body and interposed between said contacts for movement between contacts closed and opened positions,

said actuator having an opening through which said movable contact extends to abut said stationary contact to restrain movement of said actuator by engagement of said movable contact with said actuator,

a spring operatively carried by said body and biasing said actuator to the contacts open position,

said actuator extends out of said housing upon electrical tripping opening of said contacts,

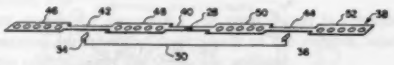
said body includes a wall for properly spacing said contacts from each other, and

said actuator has a portion mating with said wall for guiding slidable movement of said actuator relative to said wall as said actuator moves back and forth between the contacts closed and open positions.

4,123,738
HIGH VOLTAGE CURRENT LIMITING FUSE

William J. Huber, Racine, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed May 16, 1977, Ser. No. 797,063
Int. Cl.[2] H01H *85/04*
U.S. Cl. 337—159 **3 Claims**



1. In a high voltage, current limiting fuse having

a main fusible element which includes a plurality of serially related sections of relatively large cross-sectional area connected by intermediate sections of relatively small cross-sectional area,

a body of low melting temperature alloy in intimate contact with a central porton of the main fusible element, and

at least one auxiliary fusible element, each auxiliary element having at least one pair of terminals spaced slightly from other portions of the main fusible element on opposite sides of the body of alloy to form respective air gaps with the main element,

the improvement wherein:

said central portion and said other portions of the main element forming air gaps with said auxiliary element terminals, each comprise an elongated portion extending between adjoining portions of the main element, said adjoining portions including said serially related large and small sections, each said elongated portion having a cross-sectional area at any point along its extent substantially less than the largest cross-sectional area of said serially related large sections and at least as large as the smallest cross-sectional area of said serially related small sections, the length of each elongated portion being substantially

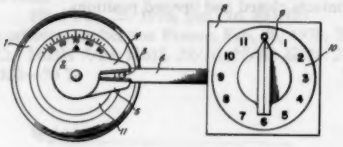
greater than the length of any one of said serially related small sections.

4,123,739

THERMOSTAT CONTROL

Thomas F. Helms, Sherman, Conn., assignor to Altek Company, Torrington, Conn.

Filed Feb. 9, 1977, Ser. No. 767,111
Int. Cl.² H01H *37/62*
U.S. Cl. 337—301 **3 Claims**



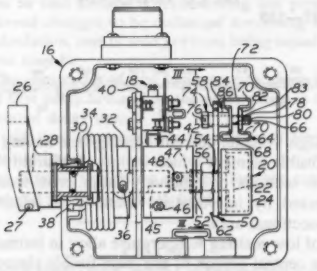
1. A thermostat control comprising an attachment for a thermostat having a rotary setting dial,
an adjustable cam assembly affixed to said dial,
a timing mechanism located adjacent the thermostat,
an arm carried by and actuated by said timing mechanism,
a pin mounted on said arm and engaged with said cam assembly
whereby motion of the timing mechanism arm actuates the pin and the engaged cam assembly for setting and resetting the thermostat dial.

4,123,740

ADJUSTABLE POTENTIOMETER IN AN ACCELERATOR CONTROL

Norman H. G. Palmer, Mentor, and Wayne T. Wiblin, Ashtabula, both of Ohio, assignors to Towmotor Corporation, Mentor, Ohio

Filed Jul. 1, 1977, Ser. No. 812,093
Int. Cl.² H01C *13/00*
U.S. Cl. 338—67 **15 Claims**



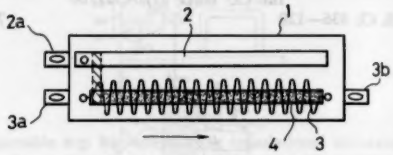
1. In apparatus having a power souce, a movable accelerator element operably connected to an accelerator control housing, a switch in the housing responsive to movement of the accelerator element and a potentiometer in the housing including an inner potentiometer portion movable relative to an outer potentiometer portion in response to movement of the accelerator element, the improvement comprising:
adjusting means connected for adjusting the outer potentiometer portion relative to the inner portion, the adjusting means including a slot formed in one end;
support means connected in the housing for supporting the adjusting means relative to the potentiometer, the support means including a slot formed in one end in overlapping relationship with the slot of the adjusting means; and
positioning means interconnecting the adjusting and support means for positioning the adjusting means relative to the support means, the positioning means includes a bolt passing through the slots.

4,123,741

RESISTANCE ELEMENT FOR VARIABLE RESISTORS

Tetsuhiro Kiyono; Moritoshi Nakamura, both of Miyagi, and Jun Nakanowatari, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 27, 1977, Ser. No. 810,082
Claims priority, application Japan, Jul. 1, 1976, 51-86980
Int. Cl.² H01C *10/30*
U.S. Cl. 338—121 **4 Claims**



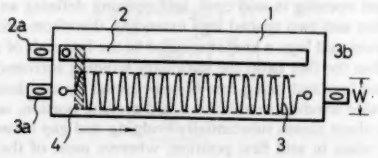
1. A variable resistor comprising:
an elongate, substantially planar base plate formed from an electrically insulating material;
a resistance element formed in a zig-zag pattern on a surface of said base plate by depositing thereon a material having a predetermined resistivity;
an elongate resistance film formed over said resistance element and extending along the central portion thereof, said resistance film being formed from a material having a resistivity higher than that of the material forming said resistance element; and
a slider having a portion thereof in sliding contact with said resistance film and adapted to be moved therealong.

4,123,742

VARIABLE RESISTOR

Moritoshi Nakamura, Miyagi, and Jun Nakanowatari, Furukawa, both of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Jun. 27, 1977, Ser. No. 810,110
Claims priority, application Japan, Jul. 2, 1976, 51-87825
Int. Cl.² H01C *10/00*
U.S. Cl. 338—137 **2 Claims**

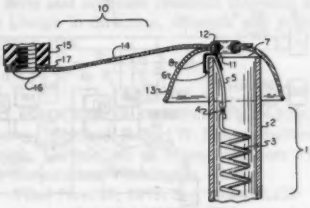


1. A variable resistor comprising:
a substrate plate formed from an electrically insulating material;
a resistance body formed in a back and forth winding pattern upon said substrate plate; and
a slider adapted to be moved along said resistance body, said slider having a width at least as wide as the widest portion of said resistance body and being provided with a plurality of contacts arranged along its width whereby the contacts of said slider will maintain a continuous electrical contact traveling along the winding length of said resistance body as said slider is moved longitudinally along said winding resistance body.

4,123,743
TERMINATION FOR AN ELECTRICAL RESISTANCE ELEMENT

John L. Eaton, Jr., Delanco, N.J., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,483
Int. Cl.[2] H01C 1/14
U.S. Cl. 338—322 11 Claims

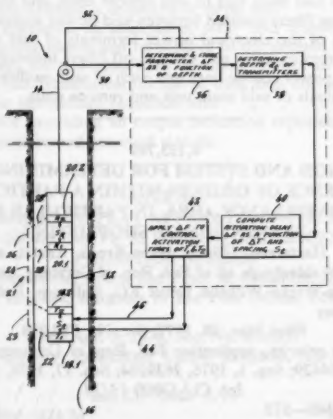


1. In an electrical resistance element comprising an open-end insulating tubular case having an axis, the open end defining a peripheral edge, and the case sheathing a helical resistance member having two ends, the combination thereof with at least one elongate, unitary termination having a first substantially axially-extending portion affixed to one of said two ends of the resistance member, and a second portion in a shape adapted to engage the peripheral edge of said case under control of said helical resistance member, only a minor fraction of the peripheral edge being engaged and said shape of the second portion alone preventing displacement of the termination in a direction perpendicular to said case.

4,123,744
METHOD AND APPARATUS FOR DYNAMICALLY INVESTIGATING A BOREHOLE

John D. Ingram, Meudon, France (92190), assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 10, 1977, Ser. No. 776,336
Int. Cl.[2] G01V 1/40
U.S. Cl. 340—15.5 TN 25 Claims



1. A method for investigating a borehole with a well logging tool having a plurality of transmitters for generating separate transmissions which may be variably and relatively delayed to provide a steerable energy beam and further having a receiver operatively located ahead of the transmitters to receive incident transmissions and generate a received wave representative of the borehole investigation comprising the steps of

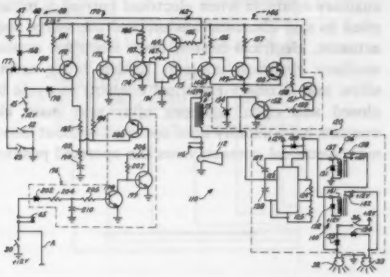
deriving a parameter from the received wave; and

automatically varying the activating delay between the transmitters as a function of the derived parameter to dynamically steer the transmissions from said transmitters in a direction towards the receiver during the borehole investigation.

4,123,745
VEHICLE THEFT PREVENTION SYSTEM

Joseph F. Gurgone, 241 W. 24th St., Chicago, Ill. 60616

Continuation-in-part of Ser. No. 707,838, Jul. 22, 1976, abandoned. This application Jan. 31, 1977, Ser. No. 763,828
Int. Cl.[2] B60R 25/04
U.S. Cl. 340—63 11 Claims



1. An automatic theft prevention system for use in a vehicle powered by an engine including an ignition system operated from an ignition switch which is closed in order to run the engine and opened in order to stop the engine, a door for entry to the vehicle, a lid for gaining access to a portion of the vehicle and first and second headlights, said theft prevention system comprising:

a first switch operable in a first state when the door is open and operable in a second state when the door is closed;

cutoff means for automatically disabling the ignition system in response to a cutoff signal and for automatically enabling the ignition system in response to a reset signal;

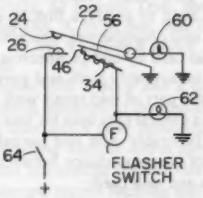
cutoff control means for generating the cutoff signal in response to the simultaneous opening of the ignition switch and the operation of the first switch in the first state, whereby the ignition system is automatically disabled; and

reset means for generating the reset signal in response to manual actuation by an operator of the vehicle, whereby the operation of the vehicle is enabled.

4,123,746
THERMAL RELAY AND AUTOMOBILE CORNERING LAMP CONTROL UTILIZING THE SAME

Gideon A. DuRocher, Mt. Clemens, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed May 23, 1977, Ser. No. 799,424
Int. Cl.[2] B60Q 1/26
U.S. Cl. 340—81 R 12 Claims



1. An electrically actuated thermal switch, which comprises:

main electrical contacts movable between a normal position and an operated position;

means biasing said main electrical contacts to said operated position;

an electrical heater;

normally closed auxiliary electrical contacts controlling electrical power supplied to said electrical heater; and

a thermally responsive actuator movable between actuated and deactuated positions, said thermally responsive actuator being situated in heat transfer relationship with said electrical heater and arranged to sequentially actuate said main electrical contacts from said normal position to said operated position and then open said normally closed auxiliary contacts when electrical current is initially supplied to said electrical heater, said thermally responsive actuator, electrical heater, main electrical contacts and auxiliary electrical contacts further being arranged to allow said auxiliary electrical contacts to cycle between closed and open positions after said main electrical contacts have initially been operated without moving said main electrical contacts from the operated position.

4,123,747

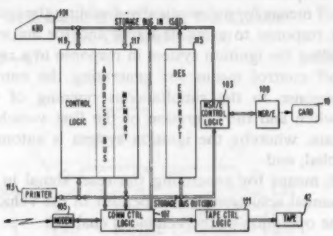
IDENTITY VERIFICATION METHOD AND APPARATUS

Donald C. Lancto, Red Hook, and Robert E. Shuck, West Hurley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 20, 1977, Ser. No. 799,050

Int. Cl.[2] G06K *7/08*; G06F *7/06*; H04Q *9/00*

U.S. Cl. 340—149 A **6 Claims**



1. A method of using a secure identification card comprising the steps of:

reading a personal encryption key and a partial result from said card:

receiving characteristic characters related to a prospective user of said card;

encrypting said characteristic characters with said key to obtain a result;

comparing a first part of said result with said partial result read from said card to verify a first level of correspondence between said characteristic character and said card;

denying use of said card by said prospective user if said first part compares unfavorably with said partial result;

comparing a second part of said result with a second partial result stored at a central data base for said card, if said first part compares favorably with said partial result to verify a second level of correspondence between said characteristic characters and said card;

denying use of said card by said prospective user if said second part compares unfavorably with said second partial result.

4,123,748

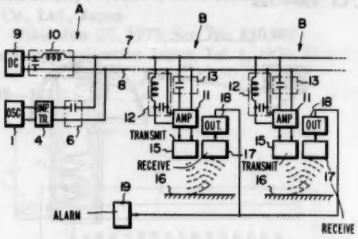
BURGLAR ALARMS UTILIZING ULTRASONIC WAVES

Hiroaki Otani, Kawasaki, Japan, assignor to Nippon Prosensor Co., Ltd., Kawasaki, Japan

Filed Dec. 8, 1976, Ser. No. 748,682

Int. Cl.[2] G08B *13/16*

U.S. Cl. 340—558 **6 Claims**



1. In an ultrasonic burglar alarm including,

a main unit having sending terminals for electrical power and for an oscillating signal,

at least one remote unit to be driven by said main unit and having receiving terminals for said electrical power and said oscillating signal, said remote units each having means responsive to said electrical power and oscillating signal for emitting a reflectable ultrasonic wave and responsive to disturbance of the reflected ultrasonic wave for producing an input signal, and an alarm actuable by said input signal, and

power source lines connecting the electrical power receiving terminals of each said remote unit to the electrical power sending terminals of said main unit,

the improvement comprised in that:

the same said power source lines also connect the oscillating signal receiving terminals of each said remote unit to the oscillating signal sending terminals of said main unit for simultaneously over the same said power source lines applying said electrical power and said oscillating signal from said main unit to said remote units, and including

low pass filters inserted between said power source line and each of the electrical power terminals of said main unit and remote units, and DC cut-off filters inserted between said power source lines and each of said oscillating signal terminals of said main unit and remote units.

4,123,749

METHOD AND SYSTEM FOR DETERMINING THE PRESENCE OF OBJECTS WITHIN A PARTICULAR SURVEILLANCE AREA, IN PARTICULAR FOR PREVENTION OF SHOPLIFTING

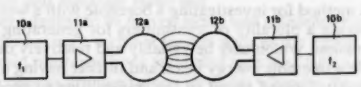
Ernst G. Hartmann, Hilden; Hans Krech, Kaarst, and Franz Meir, Waldenbuch, all of Fed. Rep. of Germany, assignors to Bizerba-Werke Wilhelm Kraut KG, Balingen, Fed. Rep. of Germany

Filed Mar. 28, 1977, Ser. No. 782,098

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1976, 2614429; Sep. 1, 1976, 2639284; Sep. 17, 1976, 2641876

Int. Cl.[2] G08B *13/24*

U.S. Cl. 340—572 **11 Claims**



1. A method for detecting the presence of objects within a particular surveillance area, in particular for detection of shoplifting, comprising generating at least two alternating magnetic

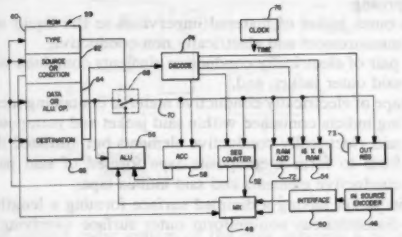
fields each of predetermined frequency in the surveillance area, affixing to the objects to be detected non-linear marking elements which upon being energized by an alternating magnetic field of predetermined fundamental frequency generate and transmit at least one harmonic signal which represents a multiple of the fundamental frequency, coupling the alternating magnetic fields to each other to form a common resulting magnetic field, and varying the alternating magnetic fields such as to form said common resultant magnetic field with a continuous charge in direction, strength and position within the surveillance area.

4,123,750

SIGNAL PROCESSOR FOR POSITION ENCODER

David E. Leney, Westford; Robert W. Stuart, Bedford, and John S. Anderegg, Carlisle, all of Mass., assignors to Dynamics Research Corporation, Wilmington, Mass.

Filed Nov. 29, 1973, Ser. No. 420,222
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 P **10 Claims**



1. A system for providing an output indication of relative position in response to signals from a position encoder comprising:

means for receiving signals from said encoder;

means for producing a selectable transformation in said received signals in response to a selection control;

means for providing the control of said transforming means and including:

means for defining a sequence of steps; and

means operative in association with said transformation producing means and responsive to the defined sequence of steps for providing said selection control to select at least one transformation for at least one corresponding step in the defined sequence; and

means for providing an output indication representative of the transformed received signals.

4,123,751

ELECTRONIC DISPLAY APPARATUS INCLUDING A DC-RESPONSIVE ELECTRO-LUMINESCENT PHOSPHOR SCREEN

David J. Gladstone, Ilford, and Peter A. Moldram, Aylesbury, both of England, assignors to The Post Office, London, England

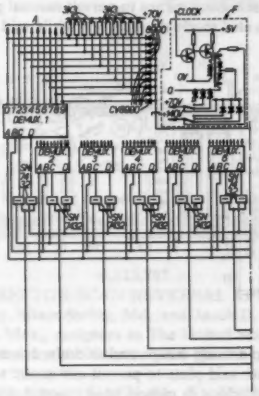
Filed Apr. 5, 1976, Ser. No. 673,697
Claims priority, application United Kingdom, Apr. 8, 1975, 14424/75
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 M **17 Claims**

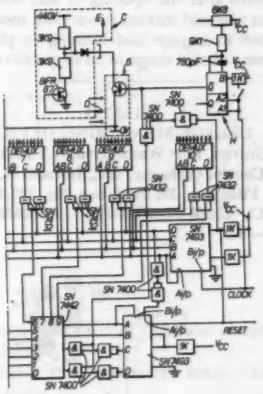
1. Display apparatus comprising:

a display screen having two transversely arranged sets of conductors with DC-responsive electro-luminescent phosphor material adapted to emit light when stimulated merely by a unidirectional electrical signal proximate the sets of conductors, and connected to a DC drive means comprising:

first means to select one or more conductors of a first set and apply to the selected conductor or conductors a first unidirectional potential difference relative to ground potential whilst simultaneously holding the remaining conductors of the first set at a second unidirectional potential between ground potential and the first potential, and

second means to select one or more conductors of a second set and apply to the selected conductor or conductors, at least partially coexistant with the application of the first





and second potentials to the first set of conductors, substantially ground potential whilst holding the remaining conductors of the second set at a third unidirectional potential between ground potential and the first potential so that said material is activated only at crossings between said selected conductors of the first and second sets.

4,123,752

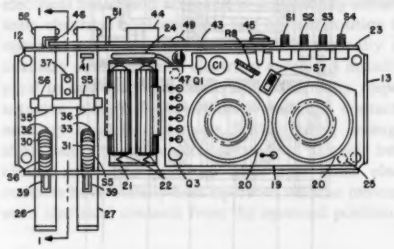
BURGLAR ALARM

Raymond J. Novotny, 52 Summit Trail, Sparta, N.J. 07871

Filed Oct. 4, 1976, Ser. No. 729,278
Int. Cl.[2] G08B *13/08*
U.S. Cl. 340—545 **8 Claims**

1. In combination with a door and a door jamb, an alarm comprising a housing mounted to the inside or protected enclosure side of said door and a plate mounted to said door jamb, said housing containing audible alarm means, manual arming means and manual pre-arming means, alarm actuation means, locking means, electric circuit latching and electric circuit time delay means having electric supply means, alarm "ON" and "OFF" electric switching means attached to said housing; said manual arming means attached to said housing and cooperat-

ing with said plate and said alarm actuation means to permit manual arming of said alarm from said inside of said door while said door is closed, said electric latching circuit cooperating with said alarm actuation means and said locking means cooperating with said plate to simultaneously and instantaneously actuate said audible alarm and lock said door; said pre-arming means attached to said housing and cooperating with said plate and said alarm actuation means to permit manual pre-arming of said alarm from said inside of said door while said door is open,



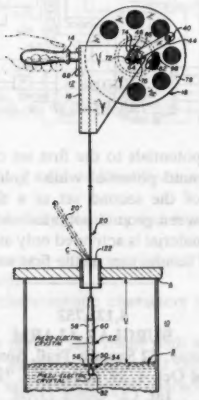
said manual pre-arming means and said alarm actuation means cooperating with said plate to permit automatic arming of said alarm when said door is closed, said electric circuit latching and said electric circuit time delay means cooperating with said alarm actuation means and said plate to actuate said audible alarm means after the opening of said door; said manual arming means and said manual pre-arming means having stop means adapted to engage said housing to place said alarm actuation means of said alarm in an inoperative condition.

4,123,753

ULLAGE MEASURING DEVICE

William H. Gravert, Port Washington, N.Y., assignor to Marine Moisture Control Company, Inc., Inwood, N.Y.

Filed Sep. 29, 1976, Ser. No. 727,894
Int. Cl.[2] G08B *21/00*; G01B *3/10*; B65H *75/30*
U.S. Cl. 340—621 **20 Claims**



1. An ullage measuring device for the measurement of fluid in a storage tank without visual sighting while affording protection from gas fumes or other noxious substances, comprising:

a fluid responsive device for producing an output signal when in contact with a fluid medium comprising a sonic energy transmitting device, sonic energy receiving device, and a housing enclosing said sonic energy devices in spaced relationship relative to each other to provide a free space therebetween to permit the application of different mediums between said transmitting and receiving devices for the transmission of sonic energy depending upon the medium, interposed in said free space, from said transmitting device to said receiving device;

a tape reel mechanism comprising a tape assembly having measuring indicia thereon, said tape assembly having one end coupled with said fluid responsive device and another end coupled with said tape reel mechanism;

an alarm indication mechanism associated with said tape reel mechanism responsive to said output signal which is generated in response to the fluid filling said free space for producing an alarm indication; and,

means coupled with said tape reel mechanism to control the amount of payout of said tape assembly for stopping the payout thereof when said fluid responsive device makes contact with said fluid medium.

18. A tape assembly for use in connection with the measurement of ullage of a liquid in a storage tank without visual inspection thereof, said tape assembly including one end adapted for connection to a detection device and its other end adapted for connection to a tape assembly payout device, comprising:

an outer jacket of material impervious to the liquid under measurement and electrically non-conductive;

A pair of electrically conductive elements contained within said outer jacket; and,

a tape of electrically conductive material containing measuring indicia contained within said jacket and juxtaposed to said electrically conductive elements but insulated therefrom to form a composite tape formed of said pair of conductive elements and said indicia tape;

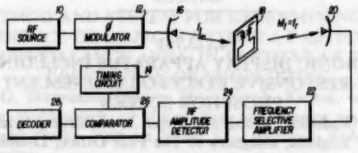
said jacket having a dimpled surface forming a lengthwise discontinuous non-uniform outer surface overlying said tape and providing for cross-sectional areas having a narrower transverse cross-section than other cross-sectional areas of said jacket, said narrower longitudinal cross-sectional areas providing for a shorter path for electrical charge to leak through said jacket to said indicia tape for dissipation to a ground on said tape assembly payout device.

4,123,754

ELECTRONIC DETECTION AND IDENTIFICATION SYSTEM

Frank L. Armstrong, Pleasantville, N.Y. 10570

Filed Jun. 28, 1976, Ser. No. 700,185
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—615 SS **12 Claims**



1. An electronic detection and identification system comprising, in combination, an electronic transmitter-receiver unit and a carrier member containing passive circuitry thereon for reflecting a signal comprising at least one selected harmonic of the signal transmitted thereto from said transmitter-receiver unit, said unit comprising a transmitter comprising a radio frequency source for generating a radio frequency signal, means for frequency sweeping said radio frequency signal with a frequency varying signal to produce a frequency swept signal and means for radiating said frequency swept signal towards said carrier member; and a receiver comprising means for receiving the signal reflected by the passive circuitry of carrier member; amplitude detector means for detecting the instantaneous amplitude envelope of the received signal; means for providing a predetermined reference signal representative of

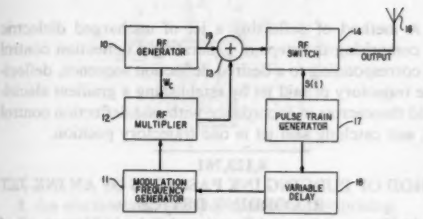
the expected received signal envelope profile corresponding to the selected harmonic of the transmitted signal and comparator means for comparing, in the time domain, the amplitude envelope of the detected signal with said reference signal, said comparator means comprising at least two comparators for comparing the amplitude envelope of the detected signal at at least two points in time sequence respectively representative of two different frequencies with two corresponding points of the reference signal.

4,123,755

RADAR INTERFERENCE REDUCTION

William Fishbein, 283 Norgrove Pl., Elberon, N.J. 07740; Reinhard Olesch, 17 Greenleaf, Englishtown, N.J. 07726, and Otto Rittenbach, 17 Jumping Brook Dr., Neptune, N.J. 07753

Filed Oct. 10, 1975, Ser. No. 621,261
Int. Cl.[2] G01S *7/28*
U.S. Cl. 343—17.1 R **4 Claims**



1. A pulsed radar system of the type wherein a beam of microwave energy interrogates a target, said target generating a return echo which is received by the interrogating antenna means for subsequent signal processing, comprising:

means for shaping the pulses comprising said beam so that the envelope of each pulse assumes a $\cos^n$ shape, n being equal to or greater than one, said shaping means including

means for generating a microwave carrier signal,

means for generating a train of pulses, each pulse having a width w,

a modulation frequency generator for shaping the waveform of said pulses of said pulse train,

a radio frequency multiplier for multiplying the output of said carrier generating means with the output of said modulation frequency generator to provide rf multiplier output frequencies spaced with respect to one another by $1/w$,

switching means interposed between the output of said multiplier and said antenna means and operated in response to said pulse train, and

delay means for adjusting the output of said pulse generating means to insure that said switching means turns on and off when $\cos^n = 0$.

4,123,756

BUILT-IN MINIATURE RADIO ANTENNA

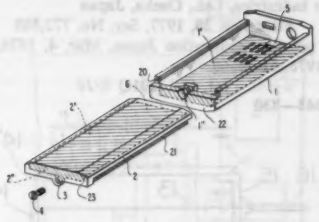
Koichi Nagata; Takashi Oda, and Koji Yamashita, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 22, 1977, Ser. No. 835,755
Claims priority, application Japan, Sep. 24, 1976, 51-115060
Int. Cl.[2] H01Q *1/24, 7/00;* H04B *1/08*
U.S. Cl. 343—702 **6 Claims**

1. An antenna for a miniature radio of the type having a housing structure formed of plastic material in two sections including a casing member adapted to accommodate a radio circuit and a cover member overlying said casing member, comprising:

(a) first and second electrically conductive members provided, respectively, on opposing sections of said housing structure,

(b) first means for interconnecting said first and second conductive members at their one ends when said cover member is fitted to said casing member, and



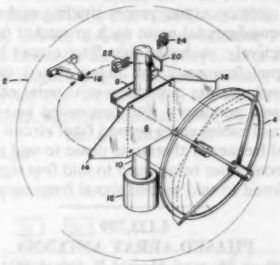
(c) second means for connecting said first and second conductive members to said radio circuit at their other ends.

4,123,757

RADAR SECTOR SCAN REVERSAL APPARATUS

Roger H. Lapp, Silver Spring, Md., and Jacob D. Schneider, Los Alamos, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1976, Ser. No. 714,732
Int. Cl.[2] H01Q *3/02*
U.S. Cl. 343—766 **9 Claims**



1. A radar sector scan reversal apparatus comprising:

a stationary element,

a motor having a shaft which can rotate clockwise and counterclockwise,

bumper means attached to the shaft,

spring means affixed to the stationary element, said spring means being positioned such that said bumper means comes into contact with said spring means prior to the end of each clockwise or counterclockwise rotation and such that said spring means stores sufficient energy following each rotation to induce rotation in the opposite direction,

means coordinated with the rotation of said shaft for switching off said motor before said spring means begins to release energy at the end of either a clockwise or counterclockwise rotation, and

means for switching on said shaft rotating motor after the direction of shaft rotation is reversed,

wherein the spring means comprises two spring members and wherein the bumper means comprises one bumper, such that one spring member contacts the bumper following a clockwise rotation and the other spring member contacts the bumper following a counterclockwise rotation, and

wherein each of said spring members comprises:

a flat spring which flexes about an axis parallel to the axis of said shaft when the flat spring comes into contact with said stationary bumper means.

4,123,758

DISC ANTENNA

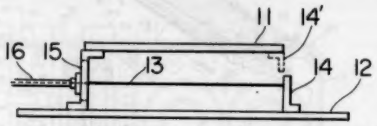
Yoshizo Shibano, Osaka; Tamao Saito, and Toshiaki Saikawa, both of Nishinomiya, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Feb. 28, 1977, Ser. No. 772,588

Claims priority, application Japan, Mar. 4, 1976, 51-23968; Feb. 27, 1976, 51-20668

Int. Cl.² H01Q 9/16

U.S. Cl. 343—830 **5 Claims**



1. A disc antenna for common use with first and second signal frequencies comprising first and second signal sources for respectively generating first and second signal frequencies, a ground plate and conductor disc spaced substantially in parallel with each other, said first and second signal sources connected to one point on the circumference of said conductor disc for signal feeding to said one point, a grounding conductor conductively shorting a circumferential point on said conductor disc diametrically opposite said one point to the point opposite said circumferential point on said ground plate, the circumference of said conductor disc divided into a plurality of sections by connection points including said circumferential point, the length of each section being at most equal to one-half of the shorter of the wave lengths of the first and second signal frequencies, said connection points dividing said sections other than said circumferential point each grounded by a first filter circuit respectively, each said first filter circuit being open to said first signal frequency and being closed to said second frequency, each middle circumferential point of each of said sections on said conductor disc connected to said one point through coaxial cables and a second filter circuit to supply the second signal frequency thereto in phase to said middle points, each said second filter being open to said first signal frequency and being closed to said second signal frequency.

4,123,759

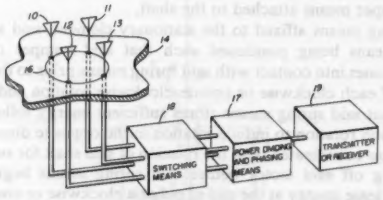
PHASED ARRAY ANTENNA

Marion E. Hines, Weston; Harold E. Stinehelfer, Sr., Burlington, and Dana W. Atchley, Jr., Lincoln, all of Mass., assignors to Microwave Associates, Inc., Burlington, Mass.

Filed Mar. 21, 1977, Ser. No. 779,701

Int. Cl.² H01Q 3/26; G01S 5/04; H01Q 19/10, 3/24

U.S. Cl. 343—854 **22 Claims**



1. An antenna system for producing from a fixed array of active antenna elements which are each omnidirectional in a plane, a sensitivity pattern that is directional in said plane and which can be rotated around the array, comprising at least three of said elements each located at the corner of a regular polygon, and means for exciting all of the elements with currents of substantially equal magnitudes that are instantaneously in the same phase at two of said corners next adjacent and on either side of a third of said corners, and different in phase by substantially 90 electrical degrees at said third corner, the distance between two adjacent corners of said polygon being in the range substantially one-quarter to substantially 0.288 of the length of a wave at the mid-frequency of the operating frequency band of said system.

4,123,760

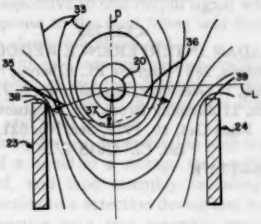
APPARATUS AND METHOD FOR JET DEFLECTION AND RECORDING

Shou L. Hou, Centerville, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 28, 1977, Ser. No. 772,845

Int. Cl.² G01D 15/18

U.S. Cl. 346—75 **26 Claims**



25. A method of deflecting a jet of uncharged dielectric liquid comprising the steps of generating a deflection control signal corresponding to a desired deflection sequence, deflecting the trajectory of said jet by establishing a gradient electrical field thereacross in accordance with said deflection control signal, and catching said jet in one trajectory position.

4,123,761

METHOD OF PURGING INK PASSAGES OF AN INK JET RECORDING DEVICE

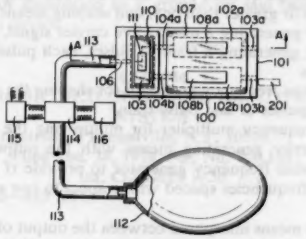
Yoshiaki Kimura; Masanori Kawai, and Takashi Hatano, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1977, Ser. No. 802,673

Claims priority, application Japan, Jun. 7, 1976, 51-66894

Int. Cl.² G01D 15/18

U.S. Cl. 346—140 R **14 Claims**



13. In an ink jet printer comprising a plurality of ink pressure chambers, each chamber having a separate valveless outlet passage and means individually controllable for suddenly reducing the volume of the chamber upon receipt of an individual electrical pulse to eject an ink droplet on demand from its outlet passage, a common ink reservoir in constant fluid communication with each of said chambers to supply ink thereto, ink being driven back into the reservoir from a chamber upon actuation of its volume reduction means simultaneously with ejecting an ink droplet from its outlet, an ink supply connected through an ink supply valve to said reservoir, means associated with said reservoir for measuring ink volume and/or pressure therein, electronic means responsive to said measuring means for opening said ink supply valve upon the ink within the reservoir falling below a certain minimum threshold and for closing said valve when the ink is above a certain upper threshold, said ink supply storing ink under a steady state pressure, whereby the volume and/or pressure of ink within said reservoir is automatically maintained between set limits, a system for purging ink therefrom, comprising:

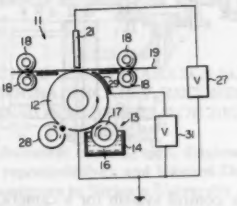
means for causing said ink supply valve to open for a predetermined time period independently of the operation of said electronic means, and

means for simultaneously and temporarily during said predetermined time period increasing the pressure of said ink supply above said steady state pressure, thereby to purge ink through each of the plurality of chambers and out their respective outlet passages, whereby bubbles and impurities are also removed.

4,123,762
IMPROVED ELECTROSTATIC HEAD WITH TONER-REPELLING ELECTRODE

Satoru Tomita; Tamio Ohori, and Shuichi Karasawa, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,599
Claims priority, application Japan, Dec. 26, 1975, 50/156512
Int. Cl.[2] G03G *15/08*; B05C *5/02*
U.S. Cl. 346—155 **15 Claims**



1. An electrostatic printing apparatus comprising;
a base electrode;
means for applying a developing substance including charged particles onto the base electrode;
a printing head including a plurality of printing electrode sets formed into an array, each printing electrode set including a plurality of shaping electrodes and a bias electrode and being disposed closely adjacent to the base electrode with the recording sheet disposed between the base electrode and the printing head;
a plurality of electrode set select wires connected to the bias electrodes of the printing electrode sets respectively;
a plurality of shaping electrode select wires each of which is connected to corresponding shaping electrodes of all of the printing electrode sets;
first voltage source means for selectively applying a first voltage to the shaping electrode select wires for printing; and
second voltage source means for applying a selected one of a second and a third voltage to the electrode set select wires, the second and third voltages both urging the charged particles against the base electrode, the first voltage being insufficient to overcome the second voltage and being sufficient to overcome the third voltage to attract only those charged particles in areas of the base electrode adjacent to shaping electrodes to which the first voltage is applied to the recording sheet for printing.

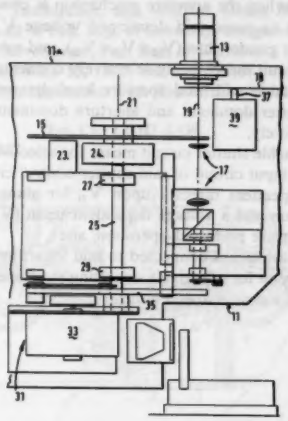
4,123,763
PHOTODRAFTING EQUIPMENT

David W. Eadie, Corfe Mullen, and Charles J. Hancock, Bournemouth, both of England, assignors to Quest Automation Limited, Dorset, England

Filed Sep. 26, 1977, Ser. No. 836,825
Claims priority, application United Kingdom, Sep. 29, 1976, 40196/76
Int. Cl.[2] G03B *41/00*
U.S. Cl. 354—4 **8 Claims**

1. In photodrafting equipment, projection apparatus comprising:

(a) first and second light sources, the first light source comprising an incandescent lamp and being operable continuously at relatively low intensity, and the second light source comprising a gas discharge lamp and being a flash source of relatively high intensity; and

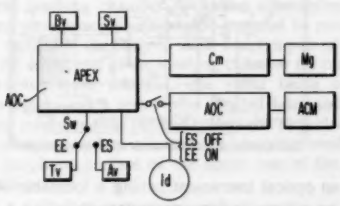


(b) light source selection means operable to enable either one of said light sources to be selected in use to provide a source for the beam of light projected by the apparatus.

4,123,764
EXPOSURE CONTROL DEVICE

Naoyuki Uno, Urawa; Tetsuji Shono, Saitama; Fumio Urano, Omiya, and Masahiro Kawasaki, Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,018
Claims priority, application Japan, Dec. 26, 1974, 50-3778
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—24 **5 Claims**



1. An automatic exposure control device for a camera, said device being capable of accomplishing at least the aperture dominant exposure control operation, the shutter dominant exposure control operation and manual exposure control operation, said device being of the type having a logarithmic compression circuit for developing voltages V_D, V_D, V_A and V_B dependent on the APEX indicating quantites Av, Tv, Sv and Bv, respectively, of aperture level A, manual exposure time T, film sensitivity S and brightness of an object B, so as to carry out the APEX operation in accordance with the relationship of $Av + Tv = Sv + Bv$; shutter speed control means for said camera having an input circuit means, said shutter speed control means being adapted to control the shutter speed in dependence upon the voltage applied to said input means, an aperture level determining means selectively operative to start adjustment of the aperture mechanism of said camera in response to the shutter release operation of said camera and to carry out said adjustment at a predetermined speed; said logarithmic compression circuit means including an aperture transducer means coactive with said aperture level determining means to develop said voltage V_E dependent upon the Av quantity; the improvement being characterized by,

(a) automatic aperture circuit means responsive to the voltage corresponding to the B_V, S_V and manually set T_V quantities for stopping the aperture level determining means when the aperture mechanism is closed down an amount to cause said developed voltage V_E to become equal or greater than $(V_A+V_B-V_D)$, said automatic aperture circuit means being selectively connectable and disconnectable with said aperture level determining means for shutter dominant and aperture dominant operations, respectively,

(b) switchable shutter circuit means for selectively applying to said input circuit of said shutter control circuit, a voltage dependent directly upon V_D for shutter preferred operation and a voltage dependent upon $(V_A+V_B-V_E)$ for aperture preferred operation, and

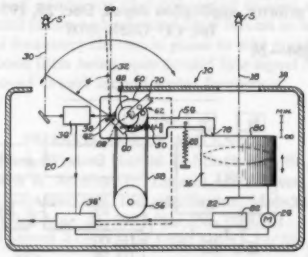
(c) indicator means connected to said logarithmic compression circuit for selectively operating as an aperture indicator and a shutter speed indicator.

4,123,765

AUTOMATIC FOCUS ADJUSTING DEVICE

Tadao Isono, Kokubunji, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha, Higashimurayama, Japan

Filed Apr. 21, 1977, Ser. No. 789,477
Int. Cl.[2] G03B *13/18*
U.S. Cl. 354—25 **10 Claims**



1. For an optical instrument having a focusable objective lens, and an automatic focusing system including a scanner optical system having a scanner means and a reference optical system wherein images of a remote subject are caused respectively to impinge on a detector means, the detector means generating an output signal representing the object distance of the subject when the images on the detector are coincident, and including means to adjust the focus of the objective lens to the object distance, the improvement in a means to relate the orientation of the scanner and the focus condition of the objective lens comprising:

reference means on said objective lens adjustable in response to variations in focus condition of said lens,

scanner driver means for driving said scanner means about an axis oscillatably through a predetermined angle,

means supporting the scanner means for arcuate movement of the axis thereof, and

means on said scanner supporting means for engagement with said objective lens focus condition reference means for arcuate positioning of said supporting means,

whereby the central alignment of said predetermined angle through which said scanner moves corresponds to the focus condition of said objective lens.

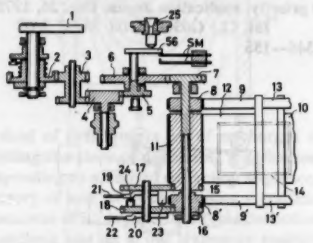
4,123,766

ELECTRICALLY CONTROLLED PHOTOGRAPHIC SHUTTER

Goro Hasegawa, Fuchu, Japan, assignor to Canon, Inc., Tokyo, Japan

Continuation of Ser. No. 443,721, Feb. 19, 1974, abandoned, which is a continuation of Ser. No. 287,018, Sep. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 886,957, Dec. 22, 1969, abandoned. This application Jul. 2, 1976, Ser. No. 701,990

Claims priority, application Japan, Dec. 28, 1968, 43-96019; Dec. 5, 1969, 44-97707; Dec. 18, 1969, 44-102147
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—51 **20 Claims**



1. An exposure control system for a camera, comprising a shutter, shutter operating means for opening and closing the shutter so as to hold the shutter open and then close it, electric shutter control means associated with said operating means for controlling the time during which said operating means holds open said shutter, said electric shutter control means assuming an effective state when electrically energized beyond a predetermined electrical value and an ineffective state in which it is not energized beyond the electrical value; mechanical control means movable into a first position in which said mechanical control means is engageable with said operating means for controlling the time during which said operating means holds open said shutter and retractable from the first position to a second position in which said mechanical control means remains out of engagement with said operating means; and first means forming a part of said electric shutter control means for assuming one condition when said electric control means is energized into the effective state and another condition when said electric shutter control means is in the ineffective state, and turn-over means associated with said first means for automatically allowing said mechanical control means to retract to the second position when said first means is in the one condition and for automatically allowing said mechanical control means to move to the first position when said first means is in the other condition.

4,123,767

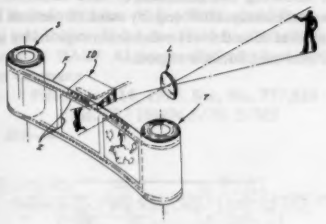
CAMERA AND FILM IDENTIFICATION SYSTEM

Neil S. Halpern, 6437 Todd Ct., Cornwells Heights, Pa. 19020

Filed Nov. 17, 1975, Ser. No. 632,385
Int. Cl.[2] G03B *17/24*
U.S. Cl. 354—107 **4 Claims**

1. A camera for photographically exposing film, the camera comprising means providing for stepwise feed of a film strip through an exposure zone from a supply to a take up reel to provide for sequential exposure of succeeding sections of the film strip and further comprising an exposure trigger, an enclosed chamber positioned in the camera between said reels in front of the exposure zone and having walls in predeterminedly fixed position with respect to each other and with one wall positioned to contact each film section along an edge thereof in the exposure zone, said one wall having permanently established portions of contrasting light transmission capability in the pattern of predeterminedly fixed distinctive camera ownership identifying indicia, the other walls of said enclosure

being opaque, an electric lamp in said chamber having a current supply circuit, and a switch in said circuit operated by said



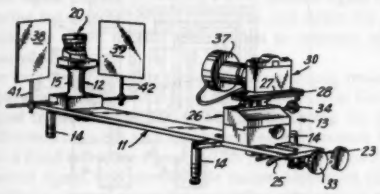
exposure trigger thereby providing for exposure of each succeeding film section with the same distinctive camera ownership identifying indicia.

4,123,768

METHOD AND APPARATUS FOR PHOTOGRAPHICALLY RECORDING THREE-DIMENSIONAL MODELS OF DENTAL ARCH PROFILES

James Kilshaw, deceased, late of Leigh, England (by Edna M. Kilshaw, legal representative), and Edward Dervin, Chadderton, England, assignors to Victoria University of Manchester, Manchester, England

Filed Mar. 9, 1977, Ser. No. 775,977
Int. Cl.[2] G03B *15/00*
U.S. Cl. 354—292 **10 Claims**



6. An apparatus for the accurate photographic recording of a three-dimensional model of a dental arch profile, which comprises:

(a) a supporting bench;

(b) a mounting platform rotatably secured perpendicular to the bench, for supporting the models of the top and bottom arches of the dental arch profile in centric occlusion with the line of intersection of the mid-saggital plane and the occlusal reference plane of the models coincident with the axis of the lens of a recording camera and the anterior of the models facing the camera at a fixed model-lens distance;

(c) means for rotating the mounting platform to rotate the models about an axis normal to the occlusal reference plane and lying in the mid-saggital plane from 7 to 23 mm. posterior of the inter-canine line;

(d) a camera holder axially slidably secured to the bench and spaced longitudinally from the mounting platform for supporting a camera, said holder including a camera base plate which is formed for mounting the camera, a pedestal supporting the camera base plate, a mounting block which vertically slidably receives the pedestal, and means for vertical adjustment of the pedestal, said mounting block including means for transverse adjustment of the pedestal and being axially slidably secured to the bench; and

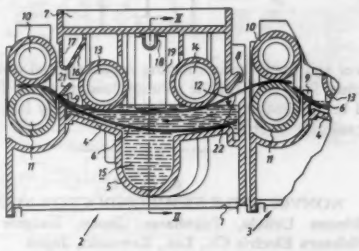
(e) means for axial adjustment of the camera holder along the bench so that said camera may be placed at a predetermined, substantially constant distance from said models.

4,123,769

WASHING CHAMBER FOR PHOTOGRAPHIC DEVELOPING APPARATUS

Avelino Fernandez, Gauting; Josef Glass, Ottobrunn; Viktor Osegowitsch, Taufkirchen, and Wilfried Hehn, Muenchen, Kleinhadern, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 796,881
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623702
Int. Cl.[2] G03D *3/08*
U.S. Cl. 354—322 **6 Claims**



1. In a developing apparatus of the type comprised of a plurality of successive processing chambers arranged for generally horizontal travel of a photographic material to be developed through the successive processing chambers, with each processing chamber being provided with a processing-fluid tank and guide means for guiding photographic material through the processing chamber, and with transport roller pairs being provided intermediate adjoining processing chambers for transporting photographic material from one chamber to the next, with the last processing chamber being a washing chamber, a washing chamber of novel construction comprising a wash-water tank containing a body of wash water with the upper surface of the body of wash water maintained at a predetermined level; guide means for guiding photographic material through the washing chamber, including submerging means for causing transported photographic material to pass below the upper surface of the body of wash water; a pair of outfeed rollers at the outlet end of the washing chamber for outfeed of washed photographic material, one roller being arranged above the other; and a spray pipe located intermediate the submerging means and the outfeed rollers and provided with a plurality of spray outlets oriented for spraying wash water onto the peripheral surface of the upper one of the pair of outfeed rollers.

4,123,770

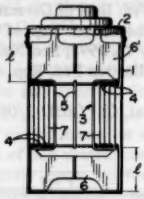
PROCESS AND APPARATUS FOR DEVELOPING PHOTOGRAPHS

Shiuta Itoh; Masuko Itoh, both of No. 16-43, 3-chome, Horinouchi, Suginami-ku, Tokyo, and Masato Kitaura, No. 33-10, 1-chome, Zoushigaya, Toshima-ku, Tokyo, all of Japan

Filed Sep. 15, 1976, Ser. No. 723,541
Claims priority, application Japan, Oct. 2, 1975, 50-119150
Int. Cl.[2] G03D *13/08*
U.S. Cl. 354—337 **5 Claims**

1. Apparatus for developing photographs comprising a development tank having an open upper end to be closed by a cap member after filled with developing solution, a film holding framework having two film guide members disposed vertically spaced with each other and adapted to hold a photographic sensitive film in the vertical position and a frame body for supporting the film guide members, a lower spacer disposed at the lower end of the tank for spacing the film on the film holding frame apart from the lower inside surface of the development tank at a distance of at least 10 millimeters, and an upper spacer for spacing the film apart from the upper inside

surface of the development tank at a distance of at least 10 millimeters, said lower and said upper spacer being formed of cross-like thin plates vertically positioned and having a height of at least 10 millimeters, said film holding frame and said



lower and upper spaces having no substantial obstacle in the vertical flow path for the solution leading to the film surfaces and being capable of providing substantially laminar flow of the solution over the film surfaces.

4,123,771

NONVOLATILE SEMICONDUCTOR MEMORY

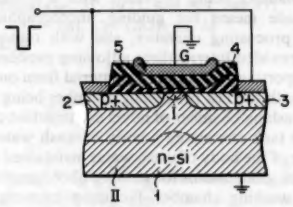
Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 507,611, Sep. 19, 1974, abandoned. This application Jul. 15, 1976, Ser. No. 705,561

Claims priority, application Japan, Sep. 21, 1973, 48-106793

Int. Cl.[2] H01L *29/78, 27/02, 29/34;* **H03K** *5/00*

U.S. Cl. 357—23 **2 Claims**



1. A metal-nitride-oxide semiconductor memory device comprising:

a semiconductor *n*-type substrate;

an elongated *p*-type source region in the surface of said substrate;

an elongated *p*-type drain region in the surface of said substrate running parallel to said elongated source region;

a first gate insulation film consisting of a very thin oxide film formed on a substrate surface region between said elongated source and drain regions;

a silicon-nitride film formed on said first gate insulation film;

first and second metal-oxide-semiconductor field-effect transistors, the source and drain of each of said transistors being said elongated source and drain regions, said transistors being positioned respectively on either side of said first gate insulation film and having respectively second and third gate insulation films between said elongated source and drain regions;

source, drain, and first, second and third gate electrodes respectively formed on said elongated source and drain regions, and said first, second and third gate insulation films, said second and third gate electrodes being separated from said first gate electrode;

means for effecting writing-in of information by ejecting carriers from said substrate surface region between said source and drain regions into electron traps in said silicon-nitride film;

means for impressing ground potential to said substrate and to said first gate electrode and a predetermined negative potential to said source, drain and second and third gate electrodes so as to form a depletion layer which surrounds completely the substrate surface region under said first gate insulation film at the time of effecting writing-in of information; and

means for allowing the potential of said substrate surface regions completely enclosed by said depletion layer to approach that of said source and drain regions by injecting carriers into said surface region.

4,123,772

MULTISEGMENT HALL ELEMENT FOR OFFSET VOLTAGE COMPENSATION

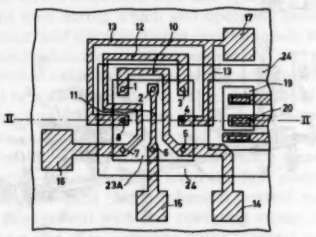
Johannes H. H. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 654,557, Feb. 2, 1976, abandoned, which is a continuation of Ser. No. 474,588, May 30, 1974, abandoned. This application May 31, 1977, Ser. No. 801,924

Claims priority, application Netherlands, Jun. 18, 1973, 7308409

Int. Cl.[2] H01L *27/22, 43/06*

U.S. Cl. 357—27 **12 Claims**



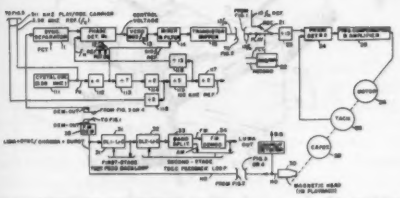
1. A Hall device with substantially suppressed offset voltage comprising a layer-shaped semiconductor body having a central portion and a peripheral portion surrounding said central portion, an even number of at least four current contact members forming a plurality of pairs of anode and cathode contact members distributed in said peripheral portion in alternate spaced arrangement, each cathode contact member being situated between two anode contact members a plurality of pairs of Hall contact members of opposite polarities forming the same even number of Hall contact members distributed in said peripheral portion in alternate spaced arrangement, each Hall contact of one polarity being situated between two Hall contacts of the opposite polarity, only one single Hall contact being present between each pair of successive anode and cathode current contact members and equidistant therefrom thus forming a plurality of adjacent arranged Hall sub-elements, the main current direction between each pair of successive anode and cathode contacts being substantially parallel to the main current direction between an associated pair of anode and cathode contacts situated diametrically opposite on the body, all anode contact members being connected to one single anode input terminal, all cathode contact members being connected to one single cathode input terminal, all Hall contact members of one polarity being connected to one single first Hall output terminal and all Hall contact members of the opposite polarity being connected to one single second Hall output terminal.

4,123,773

SERVO ARRANGEMENT FOR THE RECORDING TAPE DRIVE IN BROADBAND SIGNAL REPRODUCING SYSTEMS

Gerhard Rotter, Mission Viejo; William A. Buchan, Newport Beach, and Rainer E. an der Heiden, Anaheim, all of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,123
Int. Cl.[2] H04N 5/79, 5/785
U.S. Cl. 358—4 13 Claims



1. A servo arrangement for regulating the speed of means for driving a recording tape relative to a signal transducer in a broadband signal reproducing system, the broadband signal recorded on said tape including a synchronizing information signal; said arrangement including:

a tachometer servo loop comprising said drive means, means for producing a tachometer signal representing the speed of said drive means, means for detecting the phase difference between said tachometer signal and a tape lock reference signal and for providing a loop control signal representing the detected phase difference, and means for regulating the speed of said drive means in response to said control signal; and

a tape lock loop comprising said signal transducer, means for separating said synchronizing information signal from the signal transducer output, means for detecting the phase difference between said synchronizing information signal and a fixed reference signal and for providing an oscillator control signal, and controllable means dependent on said oscillator control signal for providing a frequency representing the tape lock reference signal to said first mentioned phase detecting means whereby said first mentioned phase detecting means is common to said tachometer loop and said tape-lock loop;

said controllable means including a voltage controlled oscillator having a center frequency, and also including means connected between said voltage controlled oscillator and said first-mentioned phase detecting means for heterodyning the voltage controlled oscillator output signal to a relatively lower frequency, whereby a highly stable tape lock reference signal is generated.

4,123,774

COLOR SIGNAL ENCODING METHODS AND APPARATUS FOR VIDEO RECORDING AND PLAYBACK

Bernhard A. Hjortzberg, Mission Viejo, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Filed Feb. 7, 1977, Ser. No. 766,541
Int. Cl.[2] H04N 5/79
U.S. Cl. 358—4 134 Claims

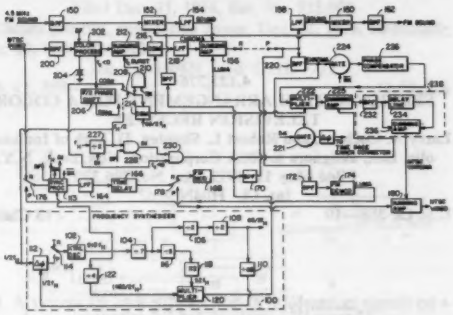
1. A method of processing a color video signal in which quadrature modulated chroma information amplitude modulated at a first carrier frequency is translated to bisequential chroma information amplitude modulated at a second carrier frequency with suppressed carrier, comprising the steps of:

(a) separating a signal representing said amplitude and quadrature modulated chroma information from said color video signal;

(b) applying said separated chroma information signal to one input of a first double balanced modulator;

(c) switching the phase of a reference source of said first carrier frequency alternately between zero degrees and ninety degrees from one horizontal video scan line to the next;

(d) mixing said phase switched first carrier reference with a reference source of said second carrier frequency to produce a signal comprising the sum and difference frequencies of said phase switched first carrier and said second carrier; and



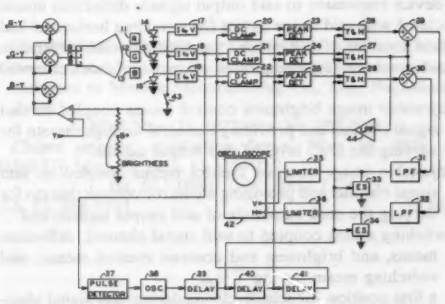
(e) applying said sum and difference frequency signal to a second input of said first double balanced modulator, whereby the output signal of said first double balanced modulator represents chroma information bisequentially amplitude modulated at said second carrier frequency with suppressed carrier.

4,123,775

APPARATUS AND METHOD FOR ADJUSTING THE COLOR TEMPERATURE OF A TELEVISION RECEIVER

Anthony R. Bugni, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed May 2, 1977, Ser. No. 792,826
Int. Cl.[2] H04N 9/62, 9/535
U.S. Cl. 358—10 4 Claims



1. An apparatus for determining the difference in color temperature between a television receiver having a partially illuminated color picture tube, and a reference color temperature comprising:

a. means for illuminating a segment of said picture tube to produce a constant brightness level;

b. light detector means for providing first, second, and third signals in response to the amount of red, green and blue light produced within said segment;

c. means for sampling said first, second and third signals of said light detectors to provide a voltage representative of said signals; and

d. means for comparing said voltages representing said first,

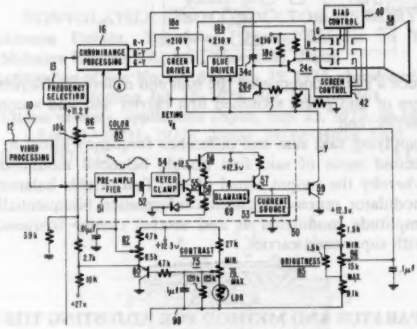
second and third signals whereby the relative magnitude of each voltage level is indicative of said reference color temperature.

4,123,776

SERVICE SWITCH ARRANGEMENT FOR A COLOR TELEVISION RECEIVER

Larry A. Cochran, and Robert L. Shanley, II, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 12, 1977, Ser. No. 796,338
Int. Cl.[2] H04N 9/62
U.S. Cl. 358—10 **13 Claims**



1. In a system for processing an image representative composite color video signal containing luminance, chrominance and synchronizing signal components, said system including a signal channel for processing said luminance and chrominance components to develop output signals, a color image reproducing device responsive to said output signals; deflection means associated with said image device for providing horizontal and vertical scanning of said image reproducing device in response to said synchronizing component; control apparatus comprising:

adjustable image brightness control means coupled to said signal channel and providing a control voltage thereto for varying the D.C. level of said output signals;

adjustable image contrast control means coupled to said signal channel and providing a control voltage thereto for varying the peak amplitude of said output signals; and

switching means coupled to said signal channel, deflection means, and brightness and contrast control means, said switching means having

a first position for selectively rendering said signal channel, deflection means, and brightness and contrast control means normally operative; and

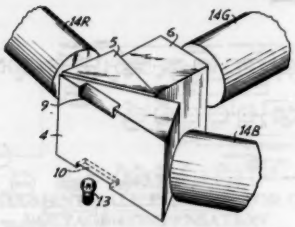
a second position for selectively rendering said signal channel inoperative to process said chrominance component, said deflection means inoperative to provide scanning of said image device in one direction, and for causing said brightness and contrast control means to respectively provide predetermined control voltages to said channel substantially independent of the setting of said brightness and contrast control means to establish predetermined values of said D.C. level and said peak amplitude of said output signals, to permit service adjustment of said image reproducing device.

4,123,777

COLOR TELEVISION CAMERA HAVING AN AUXILIARY ILLUMINATION SOURCE

Takeshi Sekiguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 782,022
Claims priority, application Japan, Mar. 20, 1976, 51/38236
Int. Cl.[2] H04N 9/04
U.S. Cl. 358—55 **6 Claims**



1. A color television camera having an auxiliary illumination source, which comprises

an objective lens;

a color separation prism receiving a light from said objective lens and providing a plurality of component color beams, said color separation prism including a plurality of prism blocks and an incidence prism within the plurality of the prism blocks and being provided with a first and a second recesses;

an auxiliary illumination device arranged on the first recess of said color separation prism; and

plural image pickup tubes on which said color component images are formed;

whereby the light coming from said auxiliary illumination device enters said color separation prism through the surface having the first recess, and a part of the light entering said color separation prism is directed to said second recess and reflected by the surface having the second recess, emitted through the exit surfaces of said color separation prism, and directed to the image pickup tubes, and the other part of light entering said color separation prism is directed to said image pickup tubes after being emitted through the exit surfaces of said color separation prism.

4,123,778

METHOD OF AND APPARATUS FOR DETERMINING THE SHARPNESS OF A PICTURE

Jean-Pierre Graf, Zürich, and Tino Celio, Ambri, both of Switzerland, assignors to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule, Zürich, Switzerland

Filed Dec. 7, 1976, Ser. No. 748,300
Claims priority, application Switzerland, Dec. 9, 1975, 15971/75
Int. Cl.[2] H04N 7/02, 5/30
U.S. Cl. 358—107 **8 Claims**

1. A method of determining the sharpness of a picture through the detection and evaluation of the absolute values of the density differences between adjoining points of the picture of at least one selected area of the picture, comprising the steps of:

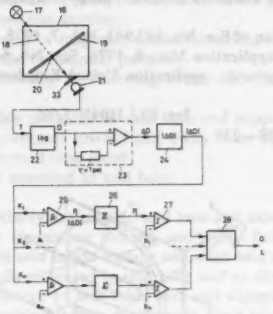
(a) determining the absolute values $|\Delta D|$ of the density-differences of a plurality of adjacent image elements within at least one area of a picture;

(b) for these absolute values, selecting at least two different threshold values $a_1 \ldots a_n$;

(c) comparing the absolute difference values $|\Delta D|$ with each of the threshold values $a_1 \ldots a_n$ and separately counting those absolute difference values which exceed each of

these threshold values to obtain a corresponding number of counts $N_1 \ldots N_n$;

(d) comparing each of the obtained counts $N_1 \ldots N_n$ with a



corresponding reference value $b_1 \ldots b_n$ to produce a decision output for each comparison; and

(e) combining the decision outputs of the comparisons to obtain a decision as to the sharpness of the image.

4,123,779

TURNTABLE ROTATIONAL SPEED AND PHASE CONTROL SYSTEM FOR A VIDEO DISC PLAY/RECORD APPARATUS

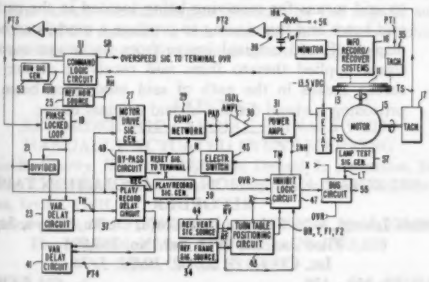
Arthur M. Goldschmidt, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,478

Claims priority, application United Kingdom, Mar. 19, 1976, 11105/76

Int. Cl.² H04N *5/76*; G11B *19/28, 17/00*

U.S. Cl. 358—128 **18 Claims**



1. In a disc record player and recorder apparatus operable in either of an information recording or recovery mode for use with a source of frames of composite video signals including horizontal and vertical synchronization pulses and means for providing a frame synchronization signal; and apparatus comprising the combination:

a turntable;

means for rotating said turntable;

means for synchronizing the speed of rotation of said turntable in response to synchronization pulses derived from said source;

means, cooperating with said turntable; for providing a signal responsive to the rotation of the turntable;

means, cooperating with said rotating means, for altering the phase of rotation of said turntable;

first means for rendering said phase altering means responsive to the phase difference between said rotation responsive signal and said frame synchronization signal; and

second means for rendering said phase altering means additionally responsive to the relative position of a predetermined sector of a disc, supported on said turntable, with respect to a predetermined sector of said turntable.

4,123,780

SIGNAL NOISE FILTRATION FOR LASER BEAM RECORDING SYSTEM

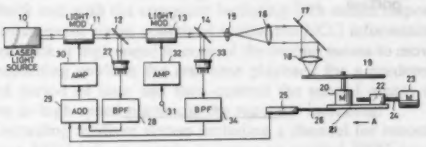
Yoshihiko Honjo, Ayase, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Dec. 21, 1976, Ser. No. 753,003

Claims priority, application Japan, Dec. 22, 1975, 50-152000; Dec. 22, 1975, 50-152001

Int. Cl.² H04N *5/76*; G11B *7/12*

U.S. Cl. 358—128 **10 Claims**



1. A system for optically recording information signals on a recording medium, comprising:

a laser beam light source;

an optical system means including a lens for focusing the laser light beam in a spot on the recording medium;

first light modulator means for modulating the intensity of the laser light beam responsive to an information signal, the light modulator means being in a light path extending from the light source to the optical system;

means in the light path for detecting signal noise components in the laser light beam; and

filter means for removing from the signal the noise components in the laser light beam responsive to an output of the detecting means,

said optical system means recording the information signal on the recording medium by the laser light beam, in which the noise components have been removed from the signal by the noise component removing means and on which the information signal has been applied by the light modulator.

4,123,781

TELEVISION TUNER WITH FINE TUNING MEANS

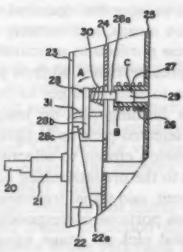
Katsuo Ito, and Kazunori Yoshimura, both of Kanazawa, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 15, 1977, Ser. No. 777,703

Claims priority, application Japan, Mar. 15, 1976, 51-31540[U]; Mar. 15, 1976, 51-31541[U]

Int. Cl.² H04B *1/26*; H03J *1/14*

U.S. Cl. 358—191 **3 Claims**



1. In a television tuner having fine tuning means comprising: the combination of a cam body provided on a sleeve for controlling fine tuning means;

said cam body having a cam surface adapted to convert rotary motion to reciprocating motion;

said fine tuning means comprising a bobbin having a coil around the outside thereof and being disposed in a direction parallel to the axis of an operating shaft of said tuner;

an L-shaped plunger having at one end a core and the other end an arm portion, said core being slidably disposed within said bobbin;

said arm portion being provided with a slit or hole and kept in contact with said cam surface at the free end thereof so that said arm reciprocates said core within said bobbin with the rotation of said sleeve; and

guide means for said L-shaped plunger provided on a tuner housing and inserted into said slit or hole in said arm portion.

4,123,782

CONTROL DEVICE FOR TELEVISION CAMERA

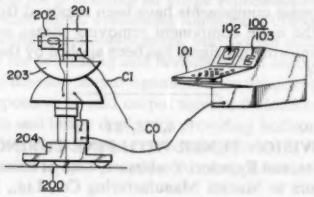
Sigeyosi Kitahara; Isamu Okada; Shigeru Jumonji, all of Tokyo; Takayuki Nemoto, Kunitachi; Shigeru Yoshimura, Yokohama; Tsunenori Soma, and Nobuhiko Shinoda, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1976, Ser. No. 706,486

Claims priority, application Japan, Jul. 18, 1975, 50-88116; Jul. 18, 1975, 50-88117; Jul. 18, 1975, 50-88118; Jul. 18, 1975, 50-88119; Jul. 18, 1975, 50-88120; Jul. 18, 1975, 50-88121

Int. Cl.[2] H04N *5/30, 5/24*

U.S. Cl. 358—210 **13 Claims**



1. A control device for a television camera, which comprises in combination:

(a) control information setting means to set control quantities of the control elements for the television camera;

(b) conversion means to convert the control quantities set by said setting means into electrical signals;

(c) memory circuits to store the electrical signals converted by said conversion means, said memory circuits having a plurality of address portions to selectively store said electrical signals in predetermined address portions;

(d) selection means to select images to be picked up, said selections means forming pick-up image signals corresponding to the selected pick-up images; and

(e) a signal transmission circuit to selectively transmit said electrical signals to the predetermined address portions of said memory circuit, said signal transmission circuit designating the address portions corresponding to said signals in response to said pick-up image signals, and applying said electrical signals to said memory circuit,

whereby the desired control quantity of the television camera in the pick-up images are stored by selection of the predetermined address portions for each pick-up image.

4,123,783

MAGNETIC BUBBLE DISPLAY SYSTEMS

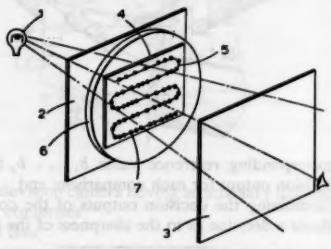
Ronald F. Pearson, Reigate; David E. Lacklison, Oxted; George B. Scott, Warnham, and John S. Palfreeman, Brockham, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 547,943, Feb. 7, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,821

Claims priority, application United Kingdom, Feb. 13, 1974, 6477/74

Int. Cl.[2] H04N *5/66*

U.S. Cl. 358—230 **12 Claims**



1. A picture transmission system comprising:

means for scanning an original image of arbitrary shape in a boustrophedral pattern to produce a video signal;

means for digitally transmitting said video signal along a communication channel;

means for receiving said video signal from said communication channel; and

means for displaying said original image comprising a source for emitting a beam of radiation; a magnetic material supporting a single magnetic bubble domain shift register channel covering a display area in a pattern corresponding to said boustrophedral scan, said channel being connected to said means for receiving being located in the path of said beam and functioning to produce a modulated beam displaying said original image from an image encoded signal applied thereto from said receiving means; and screen means in the path of said modulated beam for providing a visual display of said original image.

4,123,784

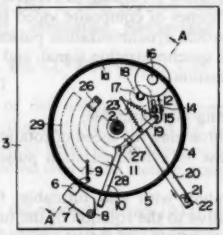
SELECTABLE FRACTION OF REVOLUTION TAPE RECORDER

Isamu Ichiugi, 4-16 1 chome Denechofu, Otaku, Tokyo, Japan

Filed Jan. 31, 1977, Ser. No. 763,901

Int. Cl.[2] G11B *25/02, 19/02, 5/76*

U.S. Cl. 360—100 **5 Claims**



1. A tape recorder comprising:

a base;

a rotatable disc rotatably mounted to said base around a vertical axis, said disc including a vertical cylindrical portion having an inside and an outside surface extending

downward from said disc, and being concentric therewith, said disc including a plurality of switching paths arranged circularly and concentrically, each including a recessed portion which extends for a fraction of the perimeter of its respective path, the fractions of the paths being different from one another;

a peripheral band of magnetic sound recording tape on the outside of said cylindrical portion;

a magnetic head for reproducing sound recorded on said tape;

a rotatable table mounted to said base and supporting said head for movement toward and away from reproducing proximity to said tape band;

a drive motor mounted to said base;

a capstan;

a slideplate slidably mounted to said base and mounting said capstan for movement toward and away from driving contact with said inside surface and with said motor;

a lever pivotally mounted to said base and so disposed and arranged relative to said table and said slideplate that it has a first setting which enables the head to move to a sound reproducing position and the capstan to move to a driving position, and a second setting in which they are removed from said positions;

first switch means mounted to said base adjacent to said switching paths and being movable from path to path, said switch means having a first and a second switching condition, one of which is closed and the other of which is open, the switching condition being determined by whether the switch means is adjacent to a recessed or non-recessed part of a respective switching path;

normally-open second switch means in parallel connection with said first switch means which can physically be closed;

and connection means in series connection with said parallel-connected switch adapted to be connected to a source of electricity;

whereby closure of said second switch means starts operation of the motor, which continues so long as one of the switching means is closed, the duration of closure of the first switch means being determined by the angular subtense of the recessed or non-recessed part of the switching track to which the first switch means is adjacent.

4,123,785

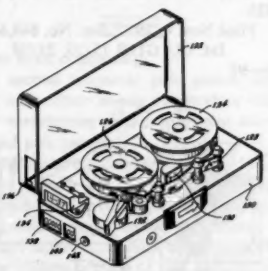
RECORDER FOR CARDIAC SIGNALS WITH MANUALLY ACTUATED EVENT MARKING

Isaac R. Cherry, Mission Viejo, and Donald L. Anderson, San Juan Capistrano, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Division of Ser. No. 717,651, Aug. 25, 1976, Pat. No. 4,073,011. This application Mar. 2, 1977, Ser. No. 773,618

Int. Cl.[2] G11B 5/00

U.S. Cl. 360—6 **6 Claims**



1. A recorder for use with a dynamic multispeed ECG computer for reproducing ECG information contained on a recording medium recorded at a particular speed and with the computer including first means for moving the recording medium past a plurality of readout positions and with the computer including second means for controlling the first means to move the recording medium at a plurality of speeds including a movement at a speed corresponding to the particular speed of recording, and including a movement of the recording medium at at least one speed greater than the particular speed to provide real time and high speed playbacks of the recorded information and with the computer including third means located at a first one of the readout positions for reproducing the recorded information when the first means moves the recording medium to provide real time playback and with the computer including fourth means located at a second one of the readout positions for reproducing the recorded information when the first means moves the recording medium to provide high speed playback and with the computer including fifth means responsive to an event signal contained within the ECG information played back at high speed to control the second means to move the recording medium for real time playback for a predetermined period of time and then control the second means to return to high speed playback, the recorder including:

a recording medium system including a channel for recording ECG information in response to applied ECG input signals,

an event marker means for producing an event signal consisting of a short burst of a predetermined number of pulses in a predetermined period of time, and

switching means coupled to the event marker means and the recording medium system for selectively interrupting the recording of the ECG information and recording the event signal on said channel of said recording medium in response to manual actuation of the switching means.

4,123,786

X-RAY EXAMINING DEVICE COMPRISING A TELEVISION CHAIN WHICH INCLUDES A MEMORY

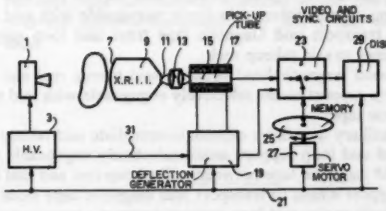
Rudy R. Cramer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 24, 1977, Ser. No. 809,847

Claims priority, application Netherlands, Jul. 7, 1976, 7607475

Int. Cl.[2] H04N 5/79

U.S. Cl. 360—35 **2 Claims**



1. An X-ray examining device which comprises:

a high voltage generator;

an X-ray source;

an X-ray detector in an image intensifier,

an image pick-up tube; and

electronic circuit means and a memory for reading a charge image produced on a photosensitive target of the image pick-up by the X-ray source via the image intensifier, for recording the image in the memory, and for displaying the image on a display screen;

wherein said electronic circuit means are connected to produce line and frame deflection signals, for reading the charge image, for image recording and for display which are synchronized with the zero crossing of the phase of power supply mains and to uncouple the said synchronization from the power supply mains at least during the switching on of the high voltage generator.

4,123,787

ELECTRONIC AND KINEMATIC CONTRIVANCE FOR A SELECTIVE RECORDING OF SIGNALS ON A SINGLE TAPE

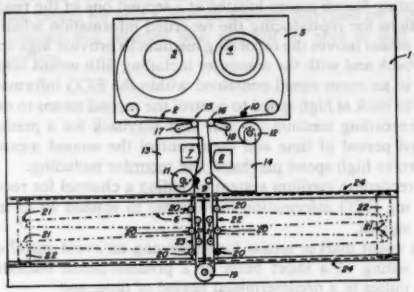
Bruno Leclerc du Sablon, Le Moulin du Gue, Couzeix, and André Dejoux, 15, rue Lakanal, 75015 Paris, both of France

Filed Jul. 15, 1976, Ser. No. 705,550

Claims priority, application France, Jul. 17, 1975, 75 22293; Jun. 24, 1976, 76 19177

Int. Cl.² G11B *15/06, 15/28*

U.S. Cl. 360—74 **6 Claims**



1. A device for recording signals on magnetic tape comprising:

a supply reel with means to drive said supply reel;

a takeup reel with means to drive said takeup reel;

loop support means intermediate said supply reel and said takeup reel, said loop support means adapted to support a loop of magnetic tape and being selectively actuatable to vary the length of said loop between a maximum and a minimum loop length;

a first tape drive capstan between said supply reel and said loop support means selectively engageable with said magnetic tape to transport said magnetic tape from said supply reel to said loop support means;

a first magnetic head between said supply reel and said loop support means selectively engageable with said magnetic tape;

a second drive capstan between said takeup reel and said loop support means selectively engageable with said tape to transport said magnetic tape from said loop support means to said takeup reel;

a second magnetic head between said takeup reel and said loop support means selectively engageable with said magnetic tape;

an auxiliary tape drive capstan intermediate said takeup reel and said loop support means selectively engageable with said magnetic tape between said takeup reel and said loop support means to transport said magnetic tape from said takeup reel to said loop support means at a transport speed higher than the transport speed of said first and second capstans;

said device operating in a cyclic manner in response to control signals from a control means, said cycle including

a short loop mode during which said magnetic tape is transported from said supply reel to said takeup reel through said loop support means which responds to said control means to support said tape at its minimum length loop, and during which said first and second capstans and heads engage said tape to record signals thereon;

a short loop to long loop transition mode during which said first capstan and magnetic head engage said tape to record signals thereon and transport said tape from said supply reel to said loop support means and during which said auxiliary tape capstan engages said tape to transport said tape from said takeup reel to said loop support means with said loop support means responding to said control means to vary the length of said loop from its minimum to its maximum length;

a long loop mode during which said tape is transported from said supply reel to said takeup reel through said loop support means with said loop support means responding to said control means to support said tape at its maximum loop length, and during which said first and second capstans and heads engage said tape to record signals thereon; and

a long loop to short loop transition mode during which said second capstan and head engage said tape to record signals thereon and transport said magnetic tape to said takeup reel, and during which said tape is transported from said loop support means to said supply reel with said loop support means responding to said control means to vary said loop length from its maximum to its minimum loop length.

4,123,788

MAGNETIC INFORMATION CARRIER WITH OPTICAL SERVO TRACKS AND APPARATUS FOR READING AND WRITING THE SAME

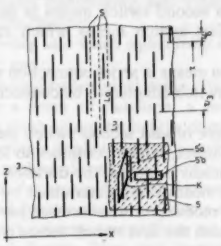
Johann Kruger, Quickborn, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,963

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1976, 2615838

Int. Cl.² G11B *7/08*

U.S. Cl. 360—77 **9 Claims**



1. Information carrier with a magnetic storage layer, comprising optical servo tracks between magnetic information tracks in said carrier said optical tracks being in the form of periodically interrupted lines, of substantially constant period length, the phase relationship between said interrupted lines differing between adjacent servo tracks in a fixed manner.

4,123,789

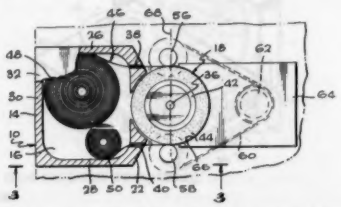
MAGNETIC TAPE STORAGE AND TRANSPORT CARTRIDGE AND MECHANISMS THEREFOR

Rubin Shatavsky, 14343 Addison St., #208, Sherman Oaks, Calif. 91423

Filed Nov. 4, 1977, Ser. No. 848,448

Int. Cl.² G11B *15/29, 23/08*

U.S. Cl. 360—96 **13 Claims**



12. A tape head mechanism including, in combination:

a magnetic tape head, said tape head having a partially

cylindrical concave surface, said surface having a cylindrical axis;

first and second capstans, said first and second capstans being rotatably mounted with respect to said tape head on rotation axes which are substantially parallel to said axis of said tape head surface, said axes of said capstans being beyond a plane through said axis of said cylindrical tape head surface from said tape head surface;

a tape cartridge, said cartridge having a body and a tape storage chamber in said body, said cartridge having a resilient pressure roll rotatably mounted on said body; and

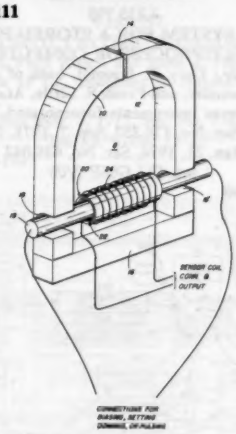
a magnetic tape having first and second ends, said magnetic tape extending around said pressure roll intermediate said ends, said magnetic tape being prestressed so that said ends of said tape coil individually upon themselves to form first and second storage coils, both said first and second storage coils being positioned within said tape storage chamber to share said tape storage chamber, said capstans engaging said tape where it extends around said pressure roll to move said tape in and out of said storage chamber and past said magnetic head.

4,123,790

MAGNETIC HEAD WITH MECHANICALLY ISOLATED THIN FILM SENSOR

Charles R. Moeller, Cardiff-by-the-Sea, and Frederick J. Jeffers, Escondido, both of Calif., assignors to Eastman Technology, Inc., Rochester, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,107
Int. Cl.² G11B 5/30
U.S. Cl. 360—111 **3 Claims**



1. A magnetic head comprising:

(a) first and second magnetic pole pieces disposed with respect to each other, means cooperative with said pole pieces for maintaining a non-magnetic transducer gap between said pole pieces;

(b) an elongated electrical conductor secured to and extending between the pole pieces remote from said transducer gap, said conductor having a thin single domain coating film of magnetic material coated therealong;

(c) a hollow non-magnetic mandril said conductor extending through the hollow portion of said mandril; and

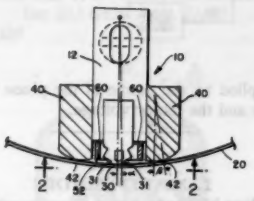
(d) a coil wound on said mandril inductively coupled to said conductor, but mechanically isolated from said film, whereby mechanical contact between the coil and the single domain film is precluded.

4,123,791

MAGNETIC TRANSDUCER DEVICE WITH OUTRIGGER BARS

Gerhard Rotter, Mission Viejo; Alojzy Bakowski, Arcadia, and Donald L. Burdorf, Newport Beach, all of Calif., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 755,214, Dec. 29, 1976, abandoned.
This application Dec. 19, 1977, Ser. No. 862,221
Int. Cl.² G11B 5/22
U.S. Cl. 360—130 **9 Claims**



1. In a magnetic transducer assembly of the type wherein a magnetic recording tape is transported under tension along a path extending over the transducing face of a magnetic head, the plane of which protrudes into the magnetic surface of said recording tape causing it to wrap over said magnetic head at an angle as the recording tape approaches and departs said transducing face, the improvement comprising:

a pair of outrigger bars mounted on the transducer assembly transverse to the path along which the recording tape is transported, each of said transverse outrigger bars being spaced from the magnetic head on opposite sides thereof and each of said transverse outrigger bars having an outer surface formed thereon facing the magnetic surface of said recording tape, the plane extending between said outer surfaces being located at a predetermined level below the plane of the transducing face of said magnetic head, whereby the wrap angle at which said recording tape passes over said transducing face is maintained at a constant, shallow value regardless of slight misalignments of the magnetic transducer assembly with respect to said recording tape path thereby inhibiting undesirable tape fly over and wear of the transducing face of said magnetic head.

4,123,792

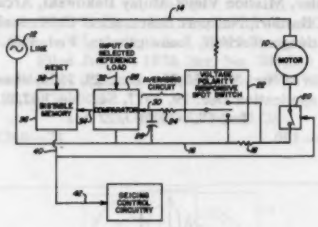
CIRCUIT FOR MONITORING THE MECHANICAL POWER FROM AN INDUCTION MOTOR AND FOR DETECTING EXCESSIVE HEAT EXCHANGER ICING

Don A. Gephart, 5400 Banbury Dr., Worthington, Ohio 43085, and Bruce H. Weber, 2370 Zollinger Rd., Columbus, Ohio 43221

Filed Apr. 7, 1977, Ser. No. 785,346
Int. Cl.² H02J 7/22
U.S. Cl. 361—30 **10 Claims**

1. A method for generating an electrical signal which is substantially proportional to the mechanical power delivered

by an induction motor, the method comprising detecting an electronic signal proportional to the average product of motor

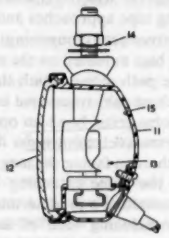


current multiplied by the cosine of the phase angle between motor current and the motor voltage.

4,123,793
LAMP REFLECTORS

John Lilley, West Midlands, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 20, 1976, Ser. No. 734,296
Int. Cl.[2] F21V *7/00*
U.S. Cl. 362—350 **10 Claims**



1. A lamp reflector comprising a dished body having a reflective coating on an inner surface thereof, said dished body being formed of a cured, low profile polyester moulding composition containing glass fibre and an, internal lubricant chemically bonded to a filler.

4,123,794
MULTI-COMPUTER SYSTEM

Yoshihiro Matsumoto, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 549,926, Feb. 14, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,909
Claims priority, application Japan, Feb. 15, 1974, 49-17536
Int. Cl.[2] G06F *15/16*
U.S. Cl. 364—101 **10 Claims**

1. A multi-computer system for control of an industrial process comprising:

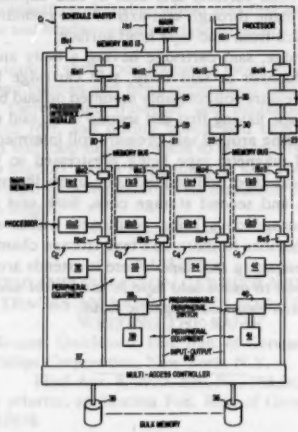
a plurality of interconnected computers each located at a position capable of access to a portion of said industrial process,

at least one bulk memory device coupled to at least one of said computers,

a multi-access controller coupled to said bulk memory device for allowing access by said computers to said bulk memory device,

said one of computers operating as a schedule master to the others and functioning to transfer data preloaded to said schedule master from storage in said bulk memory into any of said other computers in response to an invocation coming from said industrial process, said preloading of the data into said schedule master computer being performed at a time before the time at which said invocation occurs, said advanced time being varied in accordance with the load on said multi-computer system,

a programmable peripheral switch coupled between at least two of said computers other than said schedule master computer; and,

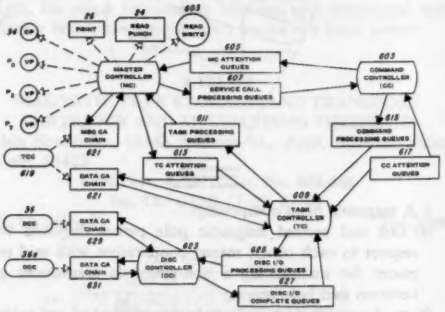


an input-output device selectively connected to one of said computers through said programmable peripheral switch, whereby upon failure of any of said computers important functions of the failed computer are transferred to another computer by switchcover of said programmable peripheral switch.

4,123,795
CONTROL SYSTEM FOR A STORED PROGRAM MULTIPROCESSOR COMPUTER

Lura C. Dean, Jr.; Gary T. Boswell, both of Austin; Wayne Winkelman, Leander, and Frank S. Little, Austin, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 178,357, Sep. 7, 1971. This application Jan. 21, 1974, Ser. No. 435,042
Int. Cl.[2] G06F *9/06*
U.S. Cl. 364—200 **23 Claims**



1. In a stored program computer comprising a plurality of data processors, a common control system comprising:

(a) a master controller, operatively connected and responsive to said plurality of data processors, and a plurality of subcontrollers wherein each of said master controller and subcontrollers has a specific function and responsibility for a plurality of said processors and wherein each of said master controller and subcontrollers is autonomous with respect to its function and responsibility; and

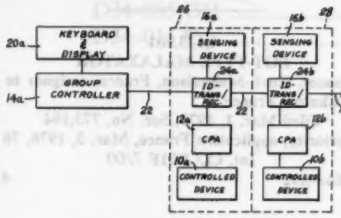
(b) memory register means for interconnecting said master controller and subcontrollers in a fixed hierarchy of control, said master controller being bilaterally connected to at least one of said subcontrollers through said memory register means, said subcontrollers being bilaterally connected to at least the next least and next most significant subcontrollers in said hierarchy through said memory register means.

4,123,796

CONTROLLER FOR ENVIRONMENTAL CONDITIONING APPARATUS

James Y. Shih, Arlington Heights, Ill., assignor to Powers Regulator Company, Skokie, Ill.

Filed Nov. 19, 1976, Ser. No. 743,110
Int. Cl. G05b *11/32*; G05d *23/22*; F24f *11/00*
U.S. Cl. 364—900 **18 Claims**



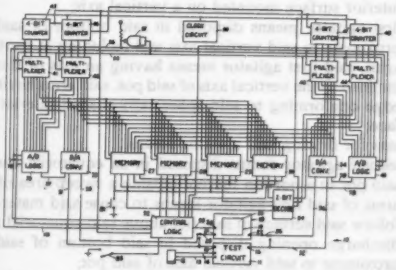
17. A controller as defined in claim 12 wherein said display means comprises means for printing information relating to the operation of a device.

4,123,797

FLYING SPOT PATTERN STORAGE SYSTEM

Eric J. Strauts, Park Ridge, and John J. Flaherty, Elk Grove Village, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Mar. 1, 1977, Ser. No. 773,338
Int. Cl.[2] G11C *11/26*
U.S. Cl. 365—118 **7 Claims**



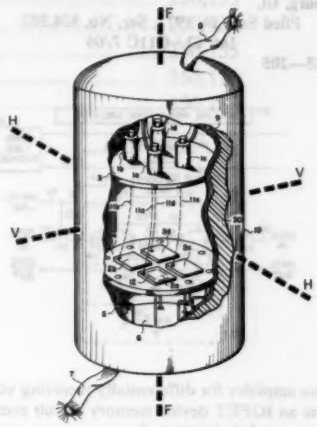
1. In a signal storage system for a display section including a cathode ray tube having a screen and including a pair of deflection signal inputs and a spot intensity control input, raster scan means for applying a low frequency sawtooth field sweep signal and a higher frequency sawtooth line sweep signal to said pair of deflection signal inputs and for causing a spot to traverse said screen in a certain raster pattern, digital memory means, memory scanning means for scanning said memory means in synchronism with said scanning of said screen and in a numerical order having a certain relationship to said raster pattern, a pair of analog signal input circuits, sampling and writing means for periodically sampling the amplitudes of signals applied to said inputs and for writing a corresponding number into said memory means, means operative during scanning of said memory means for developing an output signal in response to detection of each number stored therein, and means for applying said output signal to said spot intensity control input of said display section.

4,123,798

HIGH DENSITY BEAM-ACCESSED MEMORY WITH REFERENCE TARGET

Francis J. Cook, Topsfield, and Frederick E. Kline, Melrose, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Dec. 5, 1977, Ser. No. 857,314
Int. Cl.[2] G11C *8/00, 11/23*
U.S. Cl. 365—237 **26 Claims**



1. In a vacuum-tube device for storage of electrical data as patterns of charge stored at addressed locations upon an insulating target and accessed by electron beam means deflected to said addressed locations in a vacuum in correspondence with an addressing signal comprising a plurality of values, the combination comprising:

(a) a plurality of beam-target modules, each said beam-target module comprising an electron beam source and a facing target surface, each said electron beam source projecting an electron beam upon its respective facing target module;

(b) electron beam deflection means for providing a common deflection field for deflecting said electron beams, all of said electron beams being disposed within said deflection field and being commonly deflected thereby;

(c) first circuit means for applying a deflection signal to said electron beam deflection means for providing said common deflection field deflecting in unison the electron beams of said beam-target modules;

(d) electron-beam-sensitive reference points upon the target surface of one of said beam-target modules, said one of said beam-target modules being at least in part a reference beam-target module having a reference electron beam and a reference target surface;

(e) second circuit means coupled to said reference target surface for providing an output signal when the impingement of said reference beam upon said reference target surface falls upon any one of said reference points;

(f) third circuit means for receiving the output signal of said second circuit means and comparing it with said addressing signal and providing at least one control output signal representing the spatial difference between impingement of said reference beam and the location upon said reference target surface corresponding to a predetermined value of said addressing signal;

(g) fourth circuit means for receiving the control output signal of said third means and the deflection signal of said

first circuit means to control said first circuit means to reduce said spatial difference;

(h) fifth circuit means for coupling at least one of said plurality of beam-target modules to a system utilizing electrical data; and

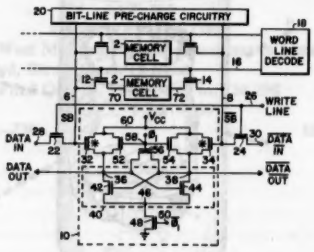
(i) sixth circuit means for control of potentials of said beam-target modules to accomplish writing, reading and erasing of electrical data.

4,123,799

HIGH SPEED IFGET SENSE AMPLIFIER/LATCH

Benjamin C. Peterson, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 19, 1977, Ser. No. 834,583
Int. Cl.² G11C *7/06*
U.S. Cl. 365—205 **10 Claims**



1. A sense amplifier for differentially receiving voltage data signals from an IGFET device memory circuit comprising:

(a) a cross-coupled circuit, and

(b) first and second depletion mode IGFET devices coupled to the cross-coupled circuit for coupling the data signals to said cross-coupled circuit, and for providing a selective differential load impedance for latching said cross-coupled circuit to one of two states.

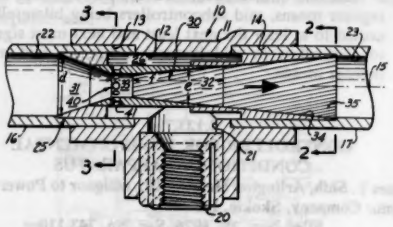
4,123,800

MIXER-INJECTOR

Angelo L. Mazzei, 11001 Mountain View, Bakersfield, Calif. 93307

Filed May 18, 1977, Ser. No. 798,242
Int. Cl.² B01F *5/04*
U.S. Cl. 366—150 **14 Claims**

1. A mixer-injector having a body with a carrier stream inlet, an additive stream inlet, an outlet, and between said carrier stream inlet and said outlet a throat means having an axis of flow, a constricting portion of decreasing diameter, an expanding portion of increasing diameter both as they progress downstream from the carrier stream inlet, and a substantially cylindrical throat portion of substantial axial length interconnecting said constricting and expanding portions, and port means discharging from said additive stream inlet into said throat portion closely adjacent to the intersection of said throat portion and said constricting portion, there being a substantial length



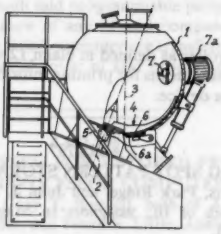
of imperforate throat portion downstream from said port means.

4,123,801

POT-TYPE MALAXATOR

Pierre Armanet, Rueil-Malmaison, France, assignor to Societe Moritz, Chatou, France

Filed Mar. 1, 1977, Ser. No. 773,184
Claims priority, application France, Mar. 3, 1976, 76 06025
Int. Cl.² B01F *7/00*
U.S. Cl. 366—292 **4 Claims**



1. A malaxator for forming a pasty mass from a material being treated which comprises:

a pot including a bottom and having a spherically-shaped interior surface mounted on a vertical axis;

a first agitator means disposed in said bottom of said pot proximate to said vertical axis and including at least two arms, said first agitator means having an axis of rotation inclined to the vertical axis of said pot, said arms having an edge conforming to said spherically-shaped interior surface;

means for driving said agitator means;

a second agitator means disposed in an equatorial zone of said pot in a portion thereof outside a sweep area of said arms of said first agitator means to cause said material to follow said surface of said pot above said equatorial zone;

a discharge opening disposed in said bottom of said pot proximate to said vertical axis of said pot;

a closure flap for closing said discharge opening; and

means for closing said closure flap during operative cycling of said malaxator.

DESIGN PATENTS

GRANTED OCT. 31, 1978

ERRATA

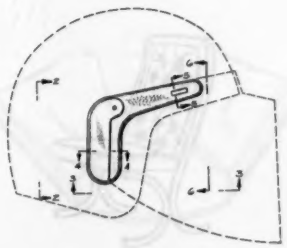
For CLASS	See PATENT NO.
D13–017	250,110
D34–005 SS	250,133
D34–005 ST	250,134
D34–005 K	250,135
D34–005 GH	250,136
D34–015 C	250,137

DESIGNS

OCTOBER 31, 1978

250,066
SHIRT
Gilbert Truedsson, New York, N.Y. 10022, assignor to The Swedish Fashion Group, Ltd., New York, N.Y.
Filed Aug. 23, 1976, Ser. No. 716,530
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—208

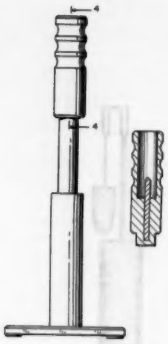
250,067
HELMET FACE SHIELD MOUNTING BRACKET
Elvert H. Land, Jr., 16205 E. Pawnee, Wichita, Kans. 67211
Filed Jan. 27, 1977, Ser. No. 763,070
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232



250,068
NIPPLE AND BOTTLE CLEANING BRUSH
Robert F. Ducotey, 1926 Kimberly Dr., Kent, Ohio 44240
Filed Oct. 11, 1977, Ser. No. 841,155
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—08

250,069
BRUSH
Jean L. Wachtel, Selestat, France, assignor to Celluloid S.A., France
Filed Aug. 5, 1977, Ser. No. 822,358
Claims priority, application France, Jun. 7, 1977, 77 158
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—35

250,070
COMBINED STICK INSERTER AND DISPLAY STAND FOR A FOOD PRODUCT
Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.
Filed Jul. 12, 1976, Ser. No. 704,433
Term of patent 14 years
Int. Cl. D6—*99*; D20—*02*
U.S. Cl. D6—25



250,071
MULTI-PASSENGER AIRCRAFT SEAT
Arque B. Dickerson, New Fairfield, Conn., assignor to UOP Inc., Des Plaines, Ill.L
Filed Jan. 10, 1977, Ser. No. 758,238
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—48

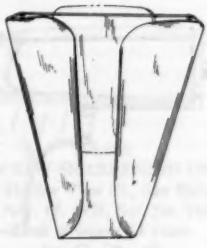
250,072
CHAIR OR SIMILAR ARTICLE
David G. Fong, 1637 Sacramento St., #15, San Francisco, Calif. 94109
Filed Nov. 26, 1976, Ser. No. 745,348
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

250,073
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Mar. 23, 1977, Ser. No. 780,650
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

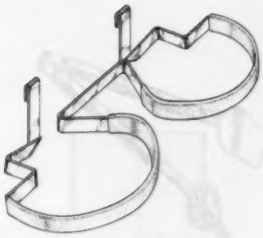
250,074
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Mar. 23, 1977, Ser. No. 780,651
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

250,075
CHAIR OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Mar. 23, 1977, Ser. No. 780,652
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67

250,076
SOAP HOLDER
Louis E. Aust, 110 Walters Ave., Johnstown, Pa. 15904
Filed Feb. 17, 1977, Ser. No. 769,590
Term of patent 14 years
Int. Cl. D6—*04;* D23—*02;* D6—*125*
U.S. Cl. D6—90; D6—125



250,077
SHOE RACK FOR LOCKER DOORS OR THE LIKE
Walter Urbach, Jr., 7906 Journey La., Springfield, Va. 22153
Filed Aug. 5, 1977, Ser. No. 822,147
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—116



250,078
COMBINED SALES AND DISPLAY UNIT FOR IRON-ON TRANSFERS OR THE LIKE
Nadine F. Gayda, 21541 Ann's La., Laguna Beach, Calif. 92651
Filed Oct. 7, 1976, Ser. No. 730,373
Term of patent 7 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—172

250,079
WORKBENCH
Ronald P. Hickman, "Badgers," Middle St., Waltham Abbey, Essex EN9 2LB, and Brian Anthony Luff, 25, Western Rd., Nazeing, Waltham Abbey, Essex, both of England
Filed Jan. 21, 1977, Ser. No. 760,940
Claims priority, application United Kingdom, Jul. 22, 1976, 976581
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—178

250,080
BARBECUE TOOL
Harold C. Kavalaris, Hoffman Estates, Ill., assignor to Keystone Aniline & Chemical Co.
Filed Jan. 31, 1977, Ser. No. 763,972
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—105

250,081
STOVE BURNER LINER
Warren H. Stansberry, Jr., and Arthur C. Kieft, both of Grand Haven, Mich., assignors to Stanco Metal Products, Inc., Grand Haven, Mich.
Filed Mar. 14, 1977, Ser. No. 776,836
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—136

250,082
KNIFE HANDLE
Carl A. Breger, Malmö, Sweden, assignor to Shapes Establishment, Vaduz, Liechtenstein
Filed Jan. 31, 1977, Ser. No. 764,156
Claims priority, application Sweden, Jul. 30, 1976, 761520
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—152

250,083
SHOVEL BLADE
Charles J. Insalaco, Pigeon Swamp Rd., South Windham, Conn. 06266
Filed Nov. 3, 1976, Ser. No. 738,540
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—10

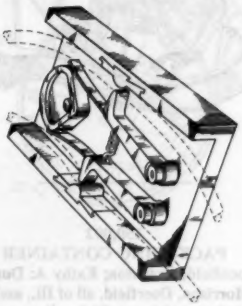
250,084
PNEUMATIC DRILL
Raymond J. Kirschensteiner; Kenneth C. Foran, both of Cleveland; Hugh T. Greenlee, Gates Mills; Roy P. Hess, Vermillion, all of Ohio, and Raymond J. Schaedler, New Hartford, N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Filed Mar. 14, 1977, Ser. No. 776,960
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—68

250,085

BLOOD FLOW CONTROLLER AND THE LIKE

Glenn L. Tuttle, Bountiful, Utah, assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Sep. 22, 1976, Ser. No. 725,654
Term of patent 14 years
Int. Cl. D8—*02*; D24—*02*
U.S. Cl. D8—72

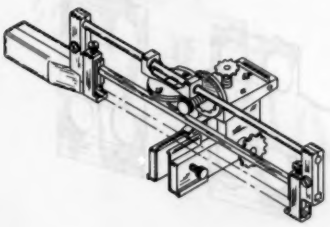


250,086

CHAIN SAW SHARPENING DEVICE

Elof Granberg, 15 Harbor View Ct., San Rafael, Calif. 94901

Filed Nov. 15, 1976, Ser. No. 741,772
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91



250,087

COMBINED LUGGAGE FLAP, TAB AND CONCEALED CATCH OR SIMILAR ARTICLE

Theodore Stark, Jersey City, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.

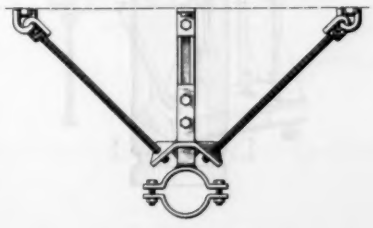
Filed Oct. 19, 1977, Ser. No. 843,747
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—346

250,088

COMBINED PIPE HANGER AND SEISMIC BRACE

James R. McDonald, Jr., 1133 Blumenfeld Dr., Sacramento, Calif. 95815

Filed Feb. 18, 1977, Ser. No. 770,185
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—355



250,089

CLIP FOR CABLES, PIPES AND ELECTRIC WIRES

Bengt E. Legerius, Nyköping, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

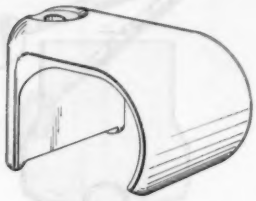
Filed Sep. 13, 1976, Ser. No. 723,016

Claims priority, application Sweden, Mar. 22, 1976, 76-0656

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—396



250,090

COMBINED BOTTLE AND CAP OR SIMILAR ARTICLE

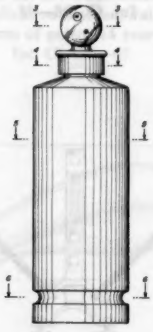
Allen H. Strang, Ridgewood, and Emil Polito, Paramus, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 7, 1976, Ser. No. 693,583

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—168



250,091

BEVERAGE CONTAINER CARRIER

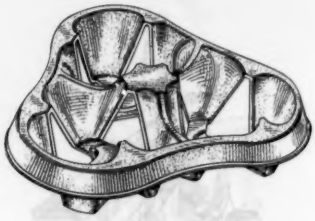
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.

Filed Oct. 22, 1976, Ser. No. 734,804

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—179



250,092

PACKAGING CONTAINER

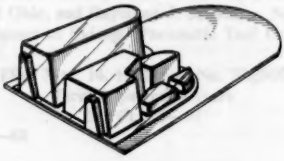
Palmer J. Schoenfield, Evanston; Kathy A: Dunn, Chicago, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 2, 1976, Ser. No. 673,251

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—192



250,093

BLANK FOR DRINKING GLASS CARRIER

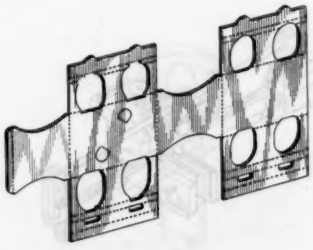
Joseph F. Schillinger, Morrison, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 30, 1976, Ser. No. 728,395

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—245

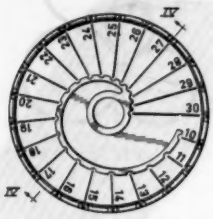


250,094

MEASURING INSTRUMENT FOR DENTAL FILES

Tore A. Forsman, Saltsjöbaden, and Christer Odvik, Djursholm, both of Sweden, assignors to Toringe Consult AB and Christer Odvik AB

Filed Jul. 8, 1976, Ser. No. 703,431
Claims priority, application Sweden, Jan. 9, 1976, 7600003
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

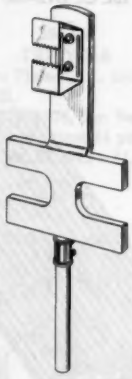


250,095

ELECTRICAL BOX SETTING GAUGE

Neil W. Douglas, and William C. Cress, Jr., both of Sanford, N.C., assignors to D. & C. Manufacturing Co., Inc.

Filed Dec. 29, 1976, Ser. No. 755,131
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64

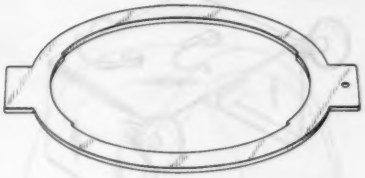


250,096

BALL GAUGE

Joseph D. Brinkley, Box 431, Liberty, N.C. 27299

Filed Mar. 18, 1977, Ser. No. 779,244
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



250,097

POSITION INDICATOR

Robert V. Hendershot, 404 Lake St., Evanston, Ill. 60201

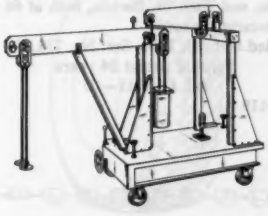
Filed Feb. 7, 1977, Ser. No. 765,986
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65

250,098

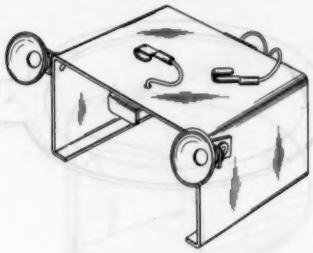
SCALE CALIBRATING MACHINE

Max van Mastrigt, Tarzana, Calif., assignor to W. C. Dillon and Company, Inc., Van Nuys, Calif.

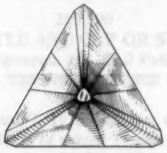
Filed Feb. 4, 1977, Ser. No. 765,668
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—83



250,099
RADAR UNIT HOLDER
Harlen F. Willis, 5330 N. Agnes, Kansas City, Mo. 64119
Filed Jan. 3, 1977, Ser. No. 756,054
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—121



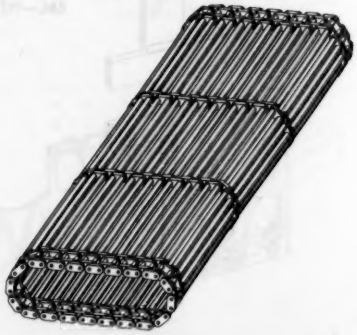
250,100
PRECIOUS, SEMIPRECIOUS OR SYNTHETIC CUT STONE
Leon Finker, 5 Riverside Dr., New York, N.Y. 10023, and Marvin Finker, 5 Keith Dr., Monsey, N.Y. 10952
Continuation of Ser. No. 847,934, Nov. 2, 1977, abandoned. This application Jan. 30, 1978, Ser. No. 873,161
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—90



250,101
CHRISTMAS GARLAND
Klaus R. Bartels, and Ruth W. Bartels, both of 66 Celeste Dr., West Hill, Ontario, Canada
Filed Oct. 12, 1976, Ser. No. 731,322
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—119

250,102
SUPPORT FOR POTTED PLANTS
Richard E. Cone, 249 Bowman Dr., Kent, Ohio 44240
Filed Nov. 10, 1977, Ser. No. 850,083
Term of patent 14 years
Int. Cl. D11—*02*; D6—*06*
U.S. Cl. D11—164

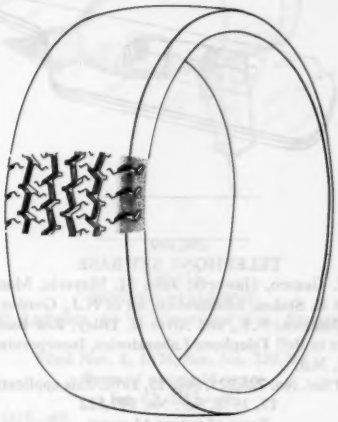
250,103
ROLLER CONVEYOR BELT
Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154
Filed Sep. 27, 1976, Ser. No. 726,551
Term of patent 14 years
Int. Cl. D12—*60*
U.S. Cl. D12—60



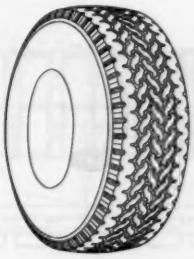
250,104
ROLLER CONVEYOR BELT WITH FLIGHTS
Ronald D. Bourgeois, 138 Ellison Park, Waltham, Mass. 02154
Filed Oct. 20, 1976, Ser. No. 734,361
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—60

250,105
TRICYCLE
Fredrick Michelau, Des Plaines, Ill., assignor to Radio Steel & Mfg. Co., Chicago, Ill.
Filed Sep. 23, 1976, Ser. No. 726,043
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112

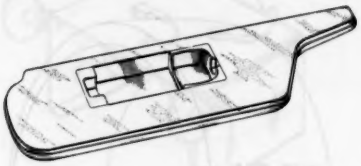
250,106
PNEUMATIC TIRE TREAD AND BUTTRESS
Gerassimos C. Candiliotis, Wilbraham, Mass., assignor to Uniroyal, Inc.
Filed Nov. 28, 1977, Ser. No. 855,148
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—143



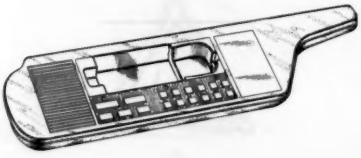
250,107
VEHICLE TIRE
Norio Iwata, Kodaira, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Sep. 1, 1977, Ser. No. 829,799
Claims priority, application Japan, Apr. 1, 1977, 52-11627
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



250,108
TELEPHONE SET BASE
Donald M. Genaro, Haworth; John A. Meyerle, Manasquan; Rembert R. Stokes, Middletown, all of N.J.; Gordon E. Sylvester, Jamaica, N.Y., and Alvin R. Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sep. 15, 1976, Ser. No. 723,221
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60



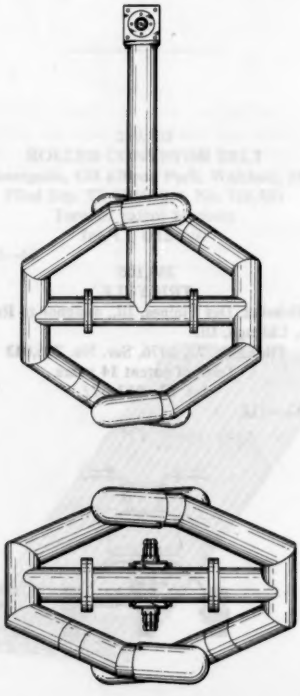
250,109
TELEPHONE SET BASE
Donald M. Genaro, Haworth; John M. Meyerle, Manasquan; Rembert R. Stokes, Middletown, all of N.J.; Gordon E. Sylvester, Jamaica, N.Y., and Alvin R. Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 723,221, Sep. 15, 1976. This application Apr. 17, 1978, Ser. No. 897,522
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. 14—60



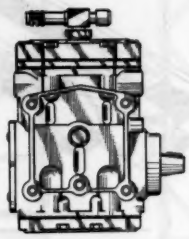
250,110
INSULATING WIRE FASTENING MEMBER FOR USE ON SHINGLES OR SIDING
Rocco Pallante, 11 Crowell Pl., Maplewood, N.J. 07040
Filed Jun. 13, 1977, Ser. No. 806,009
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—17

250,111
TELEPHONE APPARATUS
Antonio Peral Hernandez, deceased, late of Madrid, Spain, by Soledad Salcedor-Porras, widow and heir, Apolonio Morales 21, Madrid, Spain
Filed May 26, 1976, Ser. No. 689,983
Claims priority, application Spain, Nov. 26, 1975, 85.693[U]
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

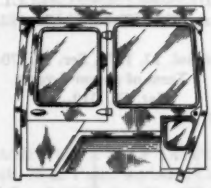
250,112
OMNIDIRECTIONAL CIRCULARLY POLARIZED TRANSMITTING ANTENNA
Thomas B. Silliman, 108 Market St., Newburgh, Ind. 47630
Filed Mar. 21, 1977, Ser. No. 779,618
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—86

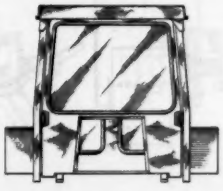


250,113
COMPRESSOR
Tetsuo Nobata, 10 Ibaragi-chou, Mizuho-ku, Nagoya City, Aichi Prefecture, Japan
Filed Nov. 19, 1976, Ser. No. 743,355
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9



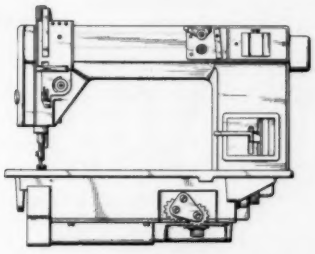
250,114
VEHICLE CAB
Jaime Segales, Vallirana (Barcelona), Spain, assignor to Massey-Ferguson Inc., Detroit, Mich.
Filed Mar. 17, 1977, Ser. No. 778,639
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D15—30



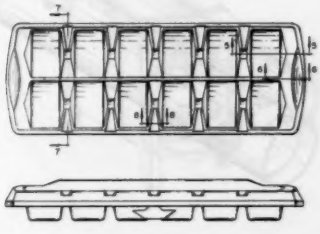


250,115
PORTABLE ELECTRICAL VACUUM CLEANER
Gentaro Kawamura, 647, Nagae, Hayama-machi, Miura-gun, Kanagawa-ken, 240-01, Japan
Filed May 20, 1976, Ser. No. 688,356
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—52

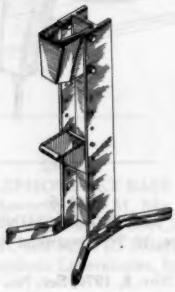
250,116
SEWING MACHINE
George D. LaPolice, 10 W. Crestwood Ave., Somerville, N.J. 08876
Filed Nov. 8, 1976, Ser. No. 739,751
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—69



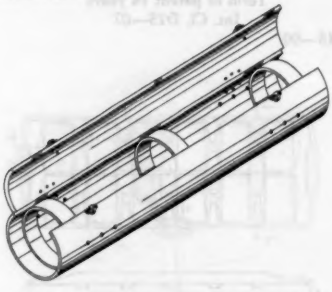
250,117
ICE CUBE TRAY
Michael G. Lalonde, 37 Lutsch Ave., Suite 5, Leamington, Ontario, Canada (N8H 2N4)
Filed Apr. 13, 1977, Ser. No. 787,009
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—90



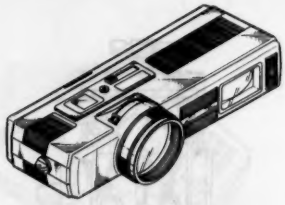
250,118
PRESS FRAME
Anthony Caccioli, Long Meadow, Mass.; Philip A. Carlson, Glastonbury, Conn., and David Guidi, Springfield, Mass., assignors to Gulf & Western Manufacturing Company
Filed Dec. 2, 1976, Ser. No. 747,121
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123



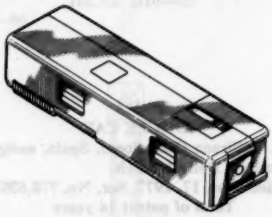
250,119
IRRIGATION SHAFT GUARD
Stephen R. Qualls, Box 321, Booker, Tex. 79005
Filed Sep. 27, 1976, Ser. No. 727,046
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—138



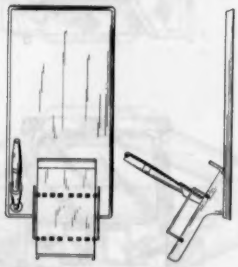
250,120
CAMERA
Tsuneaki Munakata, and Hiroshi Fukuda, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed May 5, 1976, Ser. No. 683,343
Claims priority, application Japan, Jan. 9, 1976, 51/1111
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



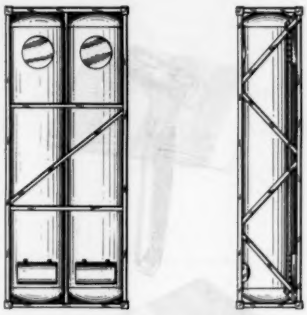
250,121
MINIATURE CAMERA
Heinz Waaske, Mascherode, Germany, assignor to Rollei-Werke Franke & Heidecke, Brunswick, Germany
Filed May 18, 1976, Ser. No. 687,529
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1975, MR 1070; Mar. 12, 1976, MR 1082
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



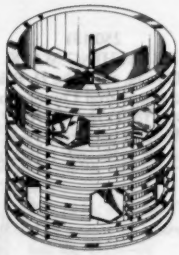
250,122
COMBINED DESK SET AND CALCULATOR STAND
Franklin J. Locke, 1050 Hillsboro Mile, Hillsboro Beach, Fla. 33062
Filed Jul. 12, 1976, Ser. No. 704,679
Term of patent 7 years
Int. Cl. D19—*02*
U.S. Cl. D19—77



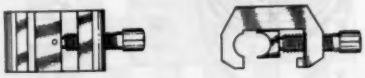
250,123
TRANSPORT CONTAINER FOR DANGEROUS LIQUIDS
Ernst Berwald, Bergkamen, Heil, Fed. Rep. of Germany, assignor to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany
Filed Jan. 10, 1977, Ser. No. 758,327
Term of patent 3½ years
Int. Cl. D23—*01*
U.S. Cl. D23—2



250,124
MODULE FOR FILTER MEDIA
Donald L. Glaspie, and Thomas L. Cantrell, both of Dallas County, Tex., assignors to Glitsch, Inc., Dallas, Tex.
Filed Aug. 27, 1976, Ser. No. 718,422
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

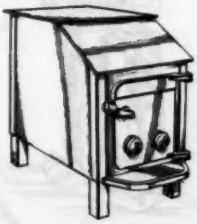


250,125
SADDLE CLAMP FOR A SELF TAPPING VALVE
Anthony C. Wilcock, 75 E. Palm, Burbank, Calif. 91501
Filed Jun. 7, 1976, Ser. No. 693,342
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40

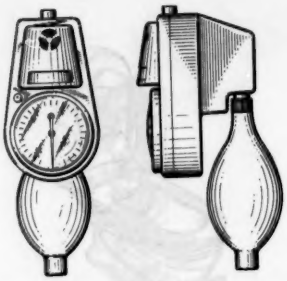


250,126
COMBINATION WATER CLOSET AND BIDET
Manfred Ibel, 178 Fifth Ave., New York, N.Y. 10010
Filed Mar. 3, 1977, Ser. No. 774,012
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—51

250,127
WOOD STOVE
Robert G. Ramacher, Jr., 2506 NE. 152 La., Anoka, Minn. 55303
Filed Feb. 22, 1977, Ser. No. 771,009
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



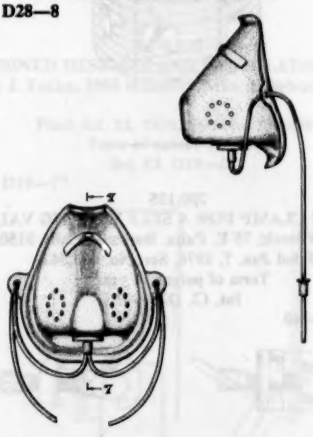
250,128
SPHYGMOMANOMETER
Tadashi Miyazawa, 131-4 Ohkido-cho, Chiba-shi, Chiba-ken, Japan, assignor to Kabushiki Kaisha Brethren Shoji, Japan
Filed Aug. 22, 1977, Ser. No. 826,665
Claims priority, application Japan, Dec. 1, 1976, 51-46660
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21



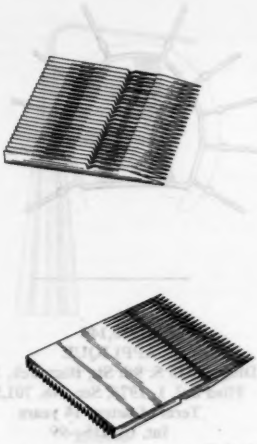
250,129
SPECIMEN COLLECTION UNIT
Norman Skinner, Camarillo, Calif., assignor to Sandoz, Inc., E. Hanover, N.J.
Filed Aug. 9, 1976, Ser. No. 712,523
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—56

250,130
RAZOR
William K. Douglas, Tokyo, Japan, assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Oct. 21, 1976, Ser. No. 734,568
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

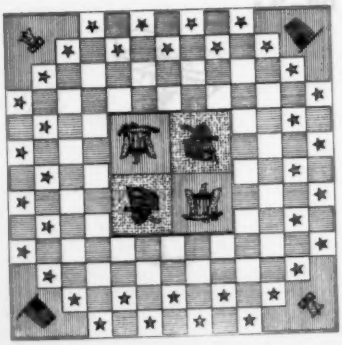
250,131
BREATHING MASK
George T. Lewis, Fallbrook, and John H. Price, La Jolla, both of Calif., assignors to Chemetron Corporation, Chicago, Ill.
Filed Oct. 18, 1976, Ser. No. 733,571
Term of patent 14 years
Int. Cl. D29—*02*; D24—*02*
U.S. Cl. D28—8



250,132
INTERDENTAL STIMULATOR BLOCK
Per Axel Torbjorn Axelsson, Barstavagen 22, Hammaro, Sweden
Filed Sep. 28, 1977, Ser. No. 837,351
Claims priority, application Sweden, Mar. 28, 1977, 690/77
Term of patent 14 years
Int. Cl. D24—*04;* D28—*08*
U.S. Cl. D28—64



250,133
GAME BOARD
Helen C. Azbill, 3689 Bridgport Ct. #4, San Jose, Calif. 95117 and Laurence G. Porter, deceased, late of Santa Clara County, Calif.; by Mildred E. Smith, administratrix, P.O. Box 734, Seminole, Okla. 74868
Filed Oct. 20, 1976, Ser. No. 734,376
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



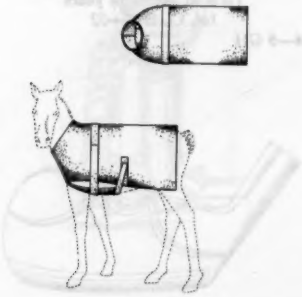
250,134
BAT OR RACKET
Alfred Baumgartner, Romanshorn, Switzerland, assignor to Zimm-Zamm Aktiengesellschaft, Zug, Switzerland
Filed Dec. 22, 1976, Ser. No. 753,376
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

250,135
EXERCISER
John G. Moyski, Denver, and Horst W. Mueller, Erie, both of Colo., assignors to Chaparral Industries, Inc., Denver, Colo.
Filed Jan. 14, 1977, Ser. No. 759,363
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 K

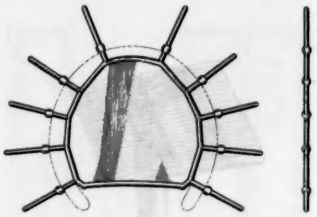
250,136
DRIVING IRON HEAD
Paul B. Gelinas, 66 Prospect St., Manchester, N.H. 03104
Filed Mar. 31, 1977, Ser. No. 783,479
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

250,137
TOY MICROPHONE
Steven R. Dorfman, Levittown, N.Y., assignor to L.J.N. Toys, Ltd., New York, N.Y.
Filed Apr. 20, 1977, Ser. No. 789,126
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C

250,138
BLANKET FOR A FOAL OR THE LIKE
Catherine Bartolac, 7090 W. 75th Ave., Schererville, Ind. 46375, and Doris J. Adkisson, 7802 W. Lincoln Hwy., Crown Point, Ind. 46307
Filed May 4, 1977, Ser. No. 793,766
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—37



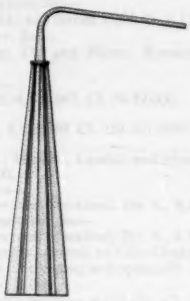
250,139
SELF-CLEANING DIAPHRAGM FOR RACING PLATE
Stanley R. Brown, 7356 Reese Rd., Sacramento, Calif. 95828
Filed Oct. 4, 1977, Ser. No. 839,264
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—35



250,140
APPLIQUE
Pauline M. Dinger, 318 S. 9th St., Bismarck, N. Dak. 58501
Filed Jul. 1, 1976, Ser. No. 701,596
Term of patent 14 years
Int. Cl. D5—*99*
U.S. Cl. D33—9 C

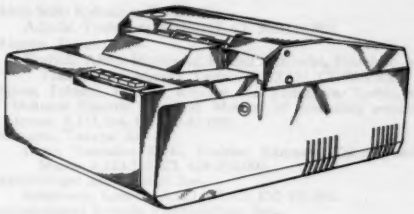
250,141
UTILITY LIGHT
Richard E. TenEyck, Wichita; Richard J. Robbins, Derby; Robert W. Fee, Wichita; Michael L. Meister, Wichita, and John R. Kraft, Wichita, all of Kans., assignors to Engmans. Inc., Des Moines, Iowa
Filed Nov. 28, 1977, Ser. No. 855,470
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 A

250,142
LAMP POST
Stig Hasselqvist, Mjolby, Sweden, assignor to Handelsbolaget Scanovator, Linkoping, Sweden
Filed Jun. 17, 1977, Ser. No. 807,497
Term of patent 14 years
Int. Cl. D26—*03;* D25—*01*
U.S. Cl. D48—38



250,143
GASOLINE DISPENSER
John A. Todd, Salisbury, Md., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Oct. 4, 1976, Ser. No. 729,314
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D52—2 A

250,144
VALIDATION/JOURNAL PRINTER
John B. Coppola, Trumbull, Conn., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed Apr. 26, 1976, Ser. No. 680,291
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11 R



250,145
CANDLE
Dominic Antinucci, Jr., 989 Washington Ave., N. Bellmore, N.Y. 11710
Filed Feb. 24, 1977, Ser. No. 771,762
Term of patent 14 years
Int. Cl. D26—*01*
U.S. Cl. D73—1 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF OCTOBER, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See—*
Merilainen, Heikki; and Strom, Ulf J. G., 4,123,169, Cl. 356-167.000.

A. B. Dick Company: *See—*
Davis, Abraham D.; and Pinter, Kenneth W., 4,123,581, Cl. 428-318.000.

A. Schild S.A.: *See—*
Visconti, Gerald, 4,122,662, Cl. 58-59.000.

AB Bofors: *See—*
Norell, Karl T., 4,123,380, Cl. 252-301.10W.

AB Kabi: *See—*
Jonsson, Nils A.; Mikiver, Lembit; and Moses, Pinchas, 4,123,543, Cl. 424-274.000.

AB Plastkarosser: *See—*
Westin, Per-Olov; and Marklund, Per A., 4,122,761, Cl. 98-33.00R.

AB Svenska Godscentraler: *See—*
Westin, Per-Olov; and Marklund, Per A., 4,122,761, Cl. 98-33.00R.

Abel, Heinz; and Berger, Alfred, to Ciba-Geigy AG. Stain removing agents and process for cleaning and optionally dyeing textile material. 4,123,378, Cl. 252-171.000.

Abele, Carl L. Portable pie case. 4,123,128, Cl. 312-244.000.

Abey, John A., to Bud Antle, Inc. Method for making molded articles of expanded cellular material. 4,123,495, Cl. 264-318.000.

Abolins, Visvaldis; and Katchman, Arthur, to General Electric Company. Antistatic polyphenylene ether compositions. 4,123,475, Cl. 260-874.000.

Ace Controls, Inc.: *See—*
Ellis, Larry C.; Ellis, John S.; and Cossin, Russell N., 4,122,923, Cl. 188-285.000.

Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED: *See—*
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,123,247, Cl. 65-141.000.

Acoustic Fiber Sound Systems, Inc.: *See—*
Croup, Robert E., 4,122,911, Cl. 181-199.000.

Acres, Gary J. K.; and Bird, Alfred J., to Johnson, Matthey & Co., Limited. Recovery of precious metals by oxidation in the aqueous phase of associated carbonaceous support material. 4,123,500, Cl. 423-35.000.

Acrow (Engineers) Limited: *See—*
Tooley, Jack R., 4,122,645, Cl. 52-648.000.

Acushnet Company: *See—*
Dusbiber, Warren M., 4,123,061, Cl. 273-220.000.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Hydraulic roosting means. 4,123,117, Cl. 303-114.000.

Adams, Patrick J.: *See—*
Getson, J. Charles; and Adams, Patrick J., 4,123,472, Cl. 260-827.000.

Addicks, Lyle F.; Gift, Bennie; and DiCicco, William R., Jr. Dual discharge valve unit. 4,122,564, Cl. 4-326.000.

Aerosol Inventions & Development S.A. AIDSA: *See—*
Butcher, Roger A., 4,122,977, Cl. 227-182.000.

Agajanian, Christopher J. Skateboard. 4,123,080, Cl. 280-87.04A.

Agency of Industrial Science & Technology: *See—*
Tasaki, Yoshio; Nakayama, Noboru; and Kajihara, Hiroshi, 4,122,990, Cl. 228-2.000.

Agfa-Gevaert AG: *See—*
Fernandez, Avelino; Glass, Josef; Osegowitsch, Viktor; and Hehn, Wilfried, 4,123,769, Cl. 354-322.000.

Agfa-Gevaert N.V.: *See—*
Gilliams, Yvan K.; De Volder, Noel J.; De Winter, Walter F.; and Tavernier, Bernard H., 4,123,374, Cl. 252-62.10L.
Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.
Van Paesschen, August J.; and Van Gossum, Lucien J., 4,123,278, Cl. 96-87.00R.

Ahern, Paul B. Lined containers for paint and the like. 4,122,973, Cl. 220-404.000.

Ahlgren, Richard M., to Aqua-Chem, Inc. Ultrafiltration and electrodialysis method and apparatus. 4,123,342, Cl. 204-180.00P.

Aihara, Mitsuo; and Ogawa, Hisaharu, to Tokyo Shibaura Electric Co., Ltd. Integrated driver circuit for display device. 4,123,671, Cl. 307-270.000.

Air Industrie: *See—*
Marchal, Paul; and Alvarez, Pierre, 4,122,611, Cl. 34-73.000.

Air Preheater Company, Inc., The: *See—*
Baker, Roderick J., 4,122,891, Cl. 165-9.000.

Air Products & Chemicals, Inc.: *See—*
Wyatt, Kenneth L.; and Ilett, Keith J., 4,123,482, Cl. 261-91.000.

Airfix Industries Limited: *See—*
Sutch, Brian L. C., 4,123,214, Cl. 425-129.00R.

Aisin Seiki Kabushiki Kaisha: *See—*
Adachi, Yoshiharu, 4,123,117, Cl. 303-114.000.

Aizawa, Tatsuo: *See—*
Fushida, Akira; Morikawa, Hiroichi; Shinsho, Toshihiro; Miyazaki, Takaaki; and Aizawa, Tatsuo, 4,123,271, Cl. 96-1.800.

Ajima, Takashi; Takaoki, Kiyoshi; and Yonezawa, Toshio, to Tokyo Shibaura Electric Co., Ltd. Method of producing semiconductor device. 4,123,564, Cl. 427-85.000.

Akiyama, Takuya: *See—*
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,123,525, Cl. 424-200.000.

Aktiebolaget Atomenergi: *See—*
Johansson, Lars O., 4,123,658, Cl. 250-390.000.

Aktiebolgatet Svenska Flaktfabriken: *See—*
Andersson, Rune S.; and Berglund, Svante O., 4,123,239, Cl. 55-379.000.

Akzona Incorporated: *See—*
Zengel, Hans-Georg; and Bergfeld, Manfred, 4,123,461, Cl. 260-558.00A.

Alamance Industries, Inc.: *See—*
Safrit, Sam C.; James, Kelly W.; and Bullock, Roger D., 4,122,555, Cl. 2-401.000.

Alaminos, Jose I. L. Machine for the automatic detection of blemishes in olives and other fruits. 4,122,951, Cl. 209-545.000.

Albany International Corp.: *See—*
Dutt, William H.; and Romanski, Eric R., 4,123,022, Cl. 245-10.000.

Alexander, Clifton J. Device for use in deactivating firearms. 4,122,620, Cl. 42-1.0LP.

Alexander, Warren A. Motorized gardening tool. 4,122,902, Cl. 172-41.000.

Alfranseder, Josef: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,123,385, Cl. 252-414.000.

Alfred Walter AG: *See—*
Walter, Alfred, 4,122,702, Cl. 73-14.000.

Allemann, James G., to Norris Industries, Inc. Sectional entrance handle retract mechanism. 4,123,097, Cl. 292-336.300.

Allen, Ralph E.; and Gibson, Christian D., to Raymond Corporation, The. Lift truck having height indicating means. 4,122,957, Cl. 214-16.40A.

Allied Chemical Corporation: *See—*
Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, 4,123,473, Cl. 260-860.000.
Pieters, Wim J. M.; Carlson, Emery J.; Gates, William E.; and Conner, William C., Jr., 4,123,389, Cl. 252-441.000.
Sifniades, Stylianos; Tunick, Allen A.; and Wohlers, Herbert C., 4,123,446, Cl. 260-439.00R.

Allis-Chalmers Corporation: *See—*
Gilmore, Thomas P.; and Stich, Frederick A., 4,123,692, Cl. 318-227.000.

Allo, Lolotte M. Cutting gauge or guide. 4,122,610, Cl. 33-186.000.

Allware Agencies Limited: *See—*
Keem, Phillip W.; Kaimins, Laimons; and Graham, James, 4,123,197, Cl. 415-123.000.

Alnor Instrument Company: *See—*
Podl, William J., 4,122,720, Cl. 73-346.000.

Alps Electric Co., Ltd.: *See—*
Kiyono, Tetsuhiro; Nakamura, Moritoshi; and Nakanowatari, Jun, 4,123,741, Cl. 338-121.000.
Murata, Taneo, 4,123,641, Cl. 200-340.000.
Nakamura, Moritoshi; and Nakanowatari, Jun, 4,123,742, Cl. 338-137.000.

Als Burmeister & Wain's Motor-OG Maskinfabrik AF 1971: *See—*
Schmidt, Oluf R., 4,122,706, Cl. 73-115.000.

Altek Company: *See—*
Helms, Thomas F., 4,123,739, Cl. 337-301.000.

Altenschopfer, Theodor; and van Wageningen, Albertus, to Henkel Kommanditgesellschaft auf Aktien. Dishwasher detergent with clear rinsing effect and method of machine washing dishes. 4,123,375, Cl. 252-99.000.

Altulor: *See—*
Evrard, Paul; and Terroy, Michel-Claude, 4,123,494, Cl. 264-258.000.

Alvarez, Pierre: *See—*
Marchal, Paul; and Alvarez, Pierre, 4,122,611, Cl. 34-73.000.

Amabili, Arnaldo. Tamper-proof container with attached end closure. 4,122,970, Cl. 220-256.000.

Amberntson, David S., to Martin Marietta Corporation. Method and system for gravity compensation of guided missiles or projectiles. 4,123,019, Cl. 244-3.200.

American Air Filter Company, Inc.: *See—*
Huntington, Robert G., 4,123,027, Cl. 248-327.000.

Thompson, Roger L., 4,122,893, Cl. 165-16.000.

American Color & Chemical Corporation: *See—*
Botros, Raouf, 4,123,223, Cl. 8-42.00D.

American Cyanamid Company: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,123,456, Cl. 562-503.000.
Conrow, Ransom B.; and Bernstein, Seymour, 4,123,455, Cl. 260-507.00R.
Hlavka, Joseph J.; and Bitha, Panayota, 4,123,607, Cl. 536-17.000.
Kupelian, Robert H., 4,123,250, Cl. 71-78.000.

American Electromedics Corporation: *See—*
Rock, Erwin H.; and Klar, Irwin, 4,122,841, Cl. 128-2.00Z.

American Home Products Corporation: *See—*
Banik, Upendra K.; and Givner, Morris L., 4,123,509, Cl. 424-12.000.
Garsky, Victor M., 4,123,425, Cl. 260-112.50S.
Givner, Morris L.; and Schilling, Guenther, 4,123,224, Cl. 422-59.000.
Krupey, John; and Welchner, Ewald F., 4,123,343, Cl. 204-180.00G.
Sellstedt, John H.; and Klaubert, Dieter H., 4,123,432, Cl. 260-293.690.

American Home Products Corp. (Del.): *See—*
Banik, Upendra K.; and Givner, Morris L., 4,123,510, Cl. 424-12.000.

American Hospital Supply Corporation: *See—*
Eitzen, Vincent E.; and Moore, Robert R., 4,122,998, Cl. 235-475.000.
Mosior, Donald J.; Cawood, Charles D., Jr.; and Ekinaka, Michael H., 4,122,856, Cl. 128-311.000.

American Motors Corporation: *See—*
Mashigan, Charles, 4,123,099, Cl. 296-10.000.

American Optical Corporation: *See—*
Chace, Howard E.; and Szwarc, Anthony F., 4,123,163, Cl. 356-124.000.
Gordon, Stanley I., 4,123,407, Cl. 260-29.6TA.
Gordon, Stanley I., 4,123,408, Cl. 260-29.6TA.

American Sterilizer Company: *See—*
Vig, Satinder K., 4,123,039, Cl. 254-9.00C.

Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, to Allied Chemical Corporation. Transparent sheets and containers formed from polycarbonate-polyester blends and formation thereof. 4,123,473, Cl. 260-860.000.

Ampex Corporation: *See—*
Borzak, Robert A., 4,122,945, Cl. 206-395.000.

AMSTED Industries Incorporated: *See—*
Shettel, Don L., 4,123,345, Cl. 204-275.000.

an der Heiden, Rainer E.: *See—*
Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer E., 4,123,773, Cl. 358-4.000.

Analog Devices, Incorporated: *See—*
Timko, Michael P.; and Brokaw, Adrian P., 4,123,698, Cl. 323-1.000.

Andco Industries, Inc.: *See—*
Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,123,339, Cl. 204-149.000.

Anderegg, John S.: *See—*
Leney, David E.; Stuart, Robert W.; and Anderegg, John S., 4,123,750, Cl. 340-347.00P.

Andersen, Thomas S.: *See—*
Grieve, Harold R.; and Andersen, Thomas S., 4,122,948, Cl. 206-622.000.

Anderson, Donald L.: *See—*
Cherry, Isaac R.; and Anderson, Donald L., 4,123,785, Cl. 360-6.000.

Anderson, Gordon C.; and Clayton, James W. B., to Platt Saco Lowell Limited. Housing and mounting means for open end spinners. 4,122,655, Cl. 57-58.890.

Anderson, Larry W.; and Franz, James H., Jr., to Westinghouse Electric Corp. Transit vehicle generated voltage control apparatus and method. 4,123,693, Cl. 318-376.000.

Anderson, Michael O., to Winnebago Industries, Inc. Sandwich panel box structure. 4,122,966, Cl. 220-1.500.

Andersson, Anders O.; and Purves, Robert B., to Boeing Company, The. Apparatus for suppressing combustion noise within gas turbine engines. 4,122,674, Cl. 60-39.650.

Andersson, Rune S.; and Berglund, Svante O., to Aktiebolgatet Svenska Flaktfabriken. Filter in a cassette frame. 4,123,239, Cl. 55-379.000.

Andreassen, Anders O. Carburetor controlled by a sliding movement. 4,123,479, Cl. 261-44.00B.

Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, to ITT Industries, Inc. Circuit arrangement for a wiper driving motor. 4,123,694, Cl. 318-443.000.

Andres, Rudolf; Busch, Gerhard; and Heiss, Werner, to Daimler-Benz Aktiengesellschaft. Headrest for a motor vehicle. 4,123,104, Cl. 297-391.000.

Andrew Wilson Company: *See—*
Querengasser, Norman A., 4,123,126, Cl. 312-201.000.

Andriulis, Vytautas, to Central Scientific Company, Inc. Modular vacuum pump assembly. 4,123,201, Cl. 417-204.000.

Andry, Paul L., III. Combined dispensing and inventory control system. 4,123,125, Cl. 312-35.000.

Anerino, Sylvester L.: *See—*
Kathmann, Stephen J.; Post, Roger L.; Herschler, Michael G.; and Anerino, Sylvester L., 4,123,203, Cl. 417-252.000.

Ang, Leoncio T.: *See—*
Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., 4,123,116, Cl. 303-103.000.

Angelino, Ralph J. Double action revolver hammer. 4,122,622, Cl. 42-65.000.

Anzai, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Speed control apparatus for AC elevator. 4,122,919, Cl. 187-29.00R.

Aoki, Shigeta: *See—*
Takigawa, Hiroyoshi; Watanabe, Shigeo; Aoki, Shigeta; and Ogawa, Hiroshi, 4,122,879, Cl. 152-209.00R.

Aqua-Chem, Inc.: *See—*
Ahlgren, Richard M., 4,123,342, Cl. 204-180.00P.

Araragi, Satoshi: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.

Ardizio, Pierre. Lock for biasing door in closed position. 4,123,096, Cl. 292-216.000.

Argereu, William. Grommet for roving machine. 4,122,653, Cl. 57-34.00R.

Armanet, Pierre, to Societe Moritz. Pot-type malaxator. 4,123,801, Cl. 366-292.000.

Armco Steel Corporation: *See—*
Arnold, Jerry L.; Dunbar, Frank C.; Gibson, Alan F.; and Pierson, Marvin B., 4,123,291, Cl. 148-6.350.
Brewer, David C.; Evans, James D.; Kohler, Dale M.; and Haselkorn, Michael H., 4,123,337, Cl. 204-129.300.
Gibson, Alan F.; and Pierson, Marvin B., 4,123,292, Cl. 148-6.350.
Granzow, Wayne G., 4,122,700, Cl. 72-342.000.
Kohler, Dale M.; Dahlstrom, Norris A.; and Taylor, David W., 4,123,298, Cl. 148-111.000.
Vice, Earl C., 4,122,779, Cl. 105-199.00R.

Armstrong, Frank L. Electronic detection and identification system. 4,123,754, Cl. 343-615.0SS.

Armstrong, Warren E.; La France, Donald S.; and Voge, Hervey H., to Shell Oil Company. Hydrazine decomposition and other reactions. 4,122,671, Cl. 60-218.000.

Arnold, Jerry L.; Dunbar, Frank C.; Gibson, Alan F.; and Pierson, Marvin B., to Armco Steel Corporation. Method of treating steel strip and sheet surfaces, in sulfur-bearing atmosphere, for metallic coating. 4,123,291, Cl. 148-6.350.

Artronix Inc.: *See—*
Krippner, Kenneth E.; and Zacher, Albert R., Jr., 4,123,657, Cl. 250-385.000.

Artzer, Paul J.: *See—*
Vischer, Peter; and Artzer, Paul J., 4,122,937, Cl. 198-408.000.

Asaeda, Tsuyoshi: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.

Asahi-Dow Limited: *See—*
Watanabe, Takeshi; and Kodama, Kenichiro, 4,123,477, Cl. 260-897.00C.

Asahi Glass Company, Ltd.: *See—*
Kanbara, Tohru; Uemura, Michihiko; and Yokoo, Nobuhiro, 4,123,731, Cl. 333-30.00R.
Ukihashi, Hiroshi; Yamabe, Masaaki; and Miyake, Haruhisa, 4,123,602, Cl. 526-206.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Kimoto, Kyoji; and Masuda, Yoshinori, 4,123,336, Cl. 204-98.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,123,764, Cl. 354-24.000.

Asahi, Koji: *See—*
Tanaka, Tsutomu; Nakamura, Yoshio; Asahi, Koji; Shiraishi, Tadayoshi; and Takahara, Kenji, 4,123,329, Cl. 195-28.00R.

Asai, Kiyotsugu: *See—*
Fukuda, Kiyou; Kawabata, Toshihiko; and Asai, Kiyotsugu, 4,123,412, Cl. 260-30.8DS.

Asai, Yasuhiko: *See—*
Kyo, Kayomon; Asai, Yasuhiko; and Tokumitsu, Shinichi, 4,123,420, Cl. 528-127.000.

Asano, Hiroaki; and Tsujiuchi, Toshio, to Toyoda Koki Kabushiki Kaisha. Grinding machine with a truing device. 4,122,635, Cl. 51-165.710.

Askam, John F., to Dunlop Limited. Tire fitting apparatus. 4,122,883, Cl. 157-1.170.

Assa, Jakob J.: *See—*
Malinovski, Yordan P.; Mednikarov, Borislav D.; and Assa, Jakob J., 4,123,280, Cl. 96-94.0BF.

Associated Portland Cement Manufacturers Limited, The: *See—*
Stringer, James A.; and Watson, David, 4,123,288, Cl. 106-100.000.

Astro Optics Corporation: *See—*
Schueler, Arthur P.; and Nagel, Robert I., 4,123,181, Cl. 404-9.000.

Atchley, Dana W., Jr.: *See—*
Hines, Marion E.; Stinehelfer, Harold E., Sr.; and Atchley, Dana W., Jr., 4,123,759, Cl. 343-854.000.

Ateliers Reunis Societe Anonyme: *See—*
Joseph, Raymond, 4,123,077, Cl. 280-47.340.

Atkins, Larry P.; and Bish, James R., to General Motors Corporation. Nozzle for the continuous casting of lead. 4,122,890, Cl. 164-444.000.

Atlas Copco Aktiebolag: *See—*
Lavon, Erik V., 4,123,108, Cl. 299-16.000.

Aurin, Friedrich, to Zeiss, Carl. Periscopic mirror system with selectably changeable direction of viewing. 4,123,151, Cl. 350-301.000.

Auto Systems Limited: *See—*
Brook, Richard M., 4,122,953, Cl. 209-551.000.

Automation Industrielle SA: *See—*
Schmid, Gunter; and Jeker, Rudolf, 4,123,312, Cl. 156-466.000.

Autotronic Controls Corporation: *See—*
Priegel, Jack C., 4,122,716, Cl. 73-231.00R.

Avaro, Michel M.; and Mangin, Pierre M. Chemically reducing solids which may be applied to the polymerization of olefins. 4,123,386, Cl. 252-429.00B.

Avco Corporation: *See—*
DeBolt, Harold E., 4,123,583, Cl. 428-336.000.

Avco Everett Research Laboratory, Inc.: *See—*
Cook, Francis J.; and Kline, Frederick E., 4,123,798, Cl. 365-237.000.

Awamura, Daikichi: *See—*
Uchiyama, Yasushi; and Awamura, Daikichi, 4,123,170, Cl. 356-167.000.

Azzara, Anthony A., to Bruning Bros. Co., Inc. Method for engaging a slider automatically on a slide fastener chain. 4,122,594, Cl. 29-408.000.

B.F. Goodrich Company, The: *See—*
Fisher, John M., 4,123,662, Cl. 250-518.000.

B & H Automotive: *See—*
Hargrove, Maxie G., 4,122,956, Cl. 211-131.000.

Backsai, Robert, to Chevron Research Company. Meta-isocyanatobenzyl isocyanate-derived polyurethanes. 4,123,605, Cl. 528-60.000.

Baermann, Max. Infinitely variable wear-free eddy current and/or hysteresis brake, preferably for track-bound vehicles. 4,122,922, Cl. 188-267.000.

Baines, Eric; and Harvey, Kenneth, to Colgate-Palmolive Company. Toothpaste compositions. 4,123,517, Cl. 424-57.000.

Baird, William C., Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph L., Jr., to Exxon Research & Engineering Co. Process for desulfurization of residua with sodamide-hydrogen and regeneration of sodamide. 4,123,350, Cl. 208-108.000.

Baker, Roderick J., to Air Preheater Company, Inc., The. Sector plate support. 4,122,891, Cl. 165-9.000.

Baker, William H. Quickly tensioned divider line for swimming pools. 4,122,560, Cl. 4-172.000.

Bakowski, Alojzy: *See—*
Rotter, Gerhard; Bakowski, Alojzy; and Burdorf, Donald L., 4,123,791, Cl. 360-130.000.

Bakshi, Kiran R., to Chevron Research Company. Regeneration of maleic anhydride vanadium-phosphorus-oxygen catalyst by contacting with sulfur trioxide. 4,123,442, Cl. 260-346.750.

Ballantyne, David B., to General Motors Corporation. Push button type switch having deformable housing sleeve for permanent attachment to conductive panel. 4,123,640, Cl. 200-296.000.

Baliast-Nedam Groep N.V.: *See—*
Middelbeek, Cornelis G., 4,123,365, Cl. 210-521.000.

Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., to Ciba-Geigy Corporation. Chromenoindole compounds. 4,123,439, Cl. 260-326.50B.

Balog, Moshe; Berkenblit, Melvin; Chan, See-Ark; and Reisman, Arnold, to International Business Machines Corporation. Method for forming smooth self limiting and pin hole free SiC films on Si. 4,123,571, Cl. 427-249.000.

Baltek Corporation: *See—*
Kohn, Jean, 4,122,878, Cl. 144-316.000.

Bandel, Paolo: *See—*
Gallizia, Achille; and Bandel, Paolo, 4,123,496, Cl. 264-329.000.

Banik, Upendra K.; and Givner, Morris L., to American Home Products Corporation. Pregnancy test. 4,123,509, Cl. 424-12.000.

Banik, Upendra K.; and Givner, Morris L., to American Home Products Corp. (Del.). Method for the determination of gonadotropins. 4,123,510, Cl. 424-12.000.

Banks, Neill K., Jr., to Bomco, Inc. Tray rocker device. 4,123,177, Cl. 336-239.000.

Barclay, Andrew C.: *See—*
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,123,416, Cl. 260-42.180.

Bard, John A.; and Morrison, Francis J., to Walcon Corporation. Wall structure. 4,122,641, Cl. 52-403.000.

Barker, Raymond H. Photographic developer turning system. 4,123,176, Cl. 366-166.000.

Barlow, Michael L., to United States of America, Navy. Wide band proportional transducer array. 4,123,681, Cl. 310-322.000.

Barnert, Konrad; and Stein, Gunter, to Volkswagenwerk Aktiengesellschaft. Injection timing adjustment apparatus. 4,122,813, Cl. 123-139.0ST.

Baron, Alvin J. Typing guide. 4,123,087, Cl. 283-1.00R.

Barone, Bruno J.: *See—*
Kerr, Ralph O.; and Barone, Bruno J., 4,123,388, Cl. 252-437.000.

Barr, Donald H.; and Coggins, Thomas A. Multipurpose cushioned horseshoe. 4,122,900, Cl. 168-12.000.

Barr, Rolla W. Shackle guard for padlocks. 4,122,693, Cl. 70-56.000.

Barr, W. Lincoln. Underwater repeating spear gun. 4,122,621, Cl. 42-1.00L.

Barr, William D. Floatable cover capable of partially or fully covering swimming pools. 4,122,561, Cl. 4-172.120.

Barrell, John M., to Renaissance Creations, Inc. Building structure. 4,122,639, Cl. 52-90.000.

Barrett, Edward J.: *See—*
Jarrett, Ronald T.; and Barrett, Edward J., 4,122,767, Cl. 100-35.000.

Bartlett, Paul A.: *See—*
Summerton, James E.; and Bartlett, Paul A., 4,123,610, Cl. 536-28.000.

Barton, James G.; and Ford, James R., to General Dynamics. Squeegee holder. 4,122,771, Cl. 101-123.000.

BASF Aktiengesellschaft: *See—*
Hjortzberg, Bernhard A., 4,123,774, Cl. 358-4.000.
Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer E., 4,123,773, Cl. 358-4.000.
Rotter, Gerhard; Bakowski, Alojzy; and Burdorf, Donald L., 4,123,791, Cl. 360-130.000.

Bastos, Eduardo R.: *See—*
Bastos, Jose R. R.; and Bastos, Eduardo R., 4,122,568, Cl. 5-345.00R.

Bastos, Jose R. R.; and Bastos, Eduardo R. Mattress of the hard surface type. 4,122,568, Cl. 5-345.00R.

Bata Shoe Company, Inc.: *See—*
Schilke, Waldemar; and Hujik, Ladislav, 4,123,493, Cl. 264-244.000.

Batcheller, Roy W., to Crane-Veyor Corporation. Pipe rail and gate construction. 4,122,631, Cl. 49-394.000.

Bates, Marvin O.: *See—*
Ott, John E.; and Bates, Marvin O., 4,122,733, Cl. 81-9.300.

Bates, William G., to Selas Corporation of America. Apparatus and method for press bending and tempering glass sheets and the like. 4,123,245, Cl. 65-104.000.

Battigelli, Jean A.: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,123,243, Cl. 65-16.000.

Baudot, Jean C. Apparatus for preparing corrugated sheets automatically. 4,123,190, Cl. 408-25.000.

Bauer, James J.; and Hoechst, Lonnie D., to Clark Equipment Company. Pedal linkage for the boom arms and attachment carrier of a skid-steered tractor vehicle. 4,122,960, Cl. 214-140.000.

Bauer Kaba AG Sicherheits-Schliessyteme: *See—*
Gretler, Heinrich, 4,122,694, Cl. 70-406.000.

Bauman, Robert A., to Colgate-Palmolive Company. Quaternary compounds having anti-microbial activity. 4,123,513, Cl. 424-54.000.

Bauman, Robert A., to Colgate-Palmolive Company. Quaternary compounds having anti-microbial activity. 4,123,514, Cl. 424-54.000.

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Baumann, Ludwig G. Bubbling device for the treatment of the human body. 4,122,846, Cl. 128-66.000.

Baumgartner, Erich R.; and Doehler, Peter. Smoothing iron sole. 4,122,615, Cl. 38-93.000.

Bayer Aktiengesellschaft: *See—*
Beecken, Hermann, 4,123,452, Cl. 260-465.00E.
Behrenz, Wolfgang; and Burkhardt, Klaus, 4,123,518, Cl. 424-78.000.
Colln, Reimer; and Sirrenberg, Wilhelm, 4,123,478, Cl. 260-986.000.
Hack, Helmut; Schmidt, Robert R.; and Dickore, Karlfried, 4,123,253, Cl. 71-93.000.
Kohler, Klaus; Woditsch, Peter; and Schultz, Karl-Heinz, 4,123,501, Cl. 423-152.000.
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,123,449, Cl. 260-453.0AR.
Wenzel, Wolfgang; and Dieterich, Dieter, 4,123,423, Cl. 528-71.000.

BBC Brown Boveri & Company Limited: *See—*
Horler, Hansulrich; and Perevuznik, Josef, 4,123,200, Cl. 417-64.000.

BC Pausch, Inc.: *See—*
Crunk, Elmer Kenneth; and Craft, John W., 4,123,034, Cl. 249-156.000.

Bearden, Roby, Jr.: *See—*
Baird, William C., Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph L., Jr., 4,123,350, Cl. 208-108.000.

Beardmore, Geoffrey, to Smiths Industries Limited. Flexure-pivot assemblies and methods of making them. 4,122,689, Cl. 64-15.00B.

Beecham Group Limited: *See—*
Howarth, Thomas T., 4,123,540, Cl. 424-272.000.

Beecken, Hermann, to Bayer Aktiengesellschaft. Styryl dyestuffs. 4,123,452, Cl. 260-465.00E.

Been, Peter: *See—*
Sheldon, Roger A.; and Been, Peter, 4,123,451, Cl. 260-465.00D.

Behnke, Walter E.; Marsh, William R.; and Haskell, Theodore H., to Warner-Lambert Company. Process for the production of 9-(β-D-arabinofuranosyl)adenine, 5'-phosphate. 4,123,609, Cl. 536-27.000.

Behrenz, Wolfgang; and Burkhardt, Klaus, to Bayer Aktiengesellschaft. Insecticidal phosphate ester-based solid composition with depot gas action. 4,123,518, Cl. 424-78.000.

Belcastro, Patricia, administratrix: *See—*
Belcastro, Rosario, deceased; and Belcastro, Patricia, administratrix, 4,122,999, Cl. 236-11.000.

Belcastro, Rosario, deceased; and by Belcastro, Patricia, administratrix. Forced air heating system. 4,122,999, Cl. 236-11.000.

Bell & Howell Company: *See*—
Karalus, George C.; and Parker, Robert R., 4,122,613, Cl. 35-9.00A.
Persha, Thomas J.; and Jagielski, David, 4,123,699, Cl. 353-26.00R.

Bell, Peter W.: *See*—
Queen, David S.; Bell, Peter W.; Dick, Thomas H.; and Edgar, John B., 4,123,313, Cl. 156-498.000.

Bell Telephone Laboratories, Incorporated: *See*—
Chandross, Edwin A.; and Pryde, Coralie A., 4,123,562, Cl. 427-58.000.
Cubbison, Richard J., Jr., 4,123,722, Cl. 330-85.000.
Marcatili, Enrique A. J., 4,123,137, Cl. 350-96.210.
Sandahl, Carl R., 4,123,139, Cl. 350-96.210.

Belles, Wayne S.: *See*—
Shen, Kelvin K.; and Belles, Wayne S., 4,123,251, Cl. 71-88.000.

Belyaeva, Agnia A.: *See*—
Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I., 4,123,735, Cl. 336-30.000.

Bendix Autolite Corporation: *See*—
Davis, Donald C., 4,123,344, Cl. 204-195.00S.

Bendix Corporation, The: *See*—
Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., 4,123,116, Cl. 303-103.000.

Bendure, Harry; and Traxson, Larry L., to Gardner-Denver Company. Multispeed gear transmission with plural inputs to internal gear. 4,122,731, Cl. 74-674.000.

Benge, Robert J.; and Miller, Cecil H., to United Kingdom of Great Britain and Northern Ireland, Ministry of Technology in Her Britannic Majesty's Government of the. Ignitable compositions. 4,123,303, Cl. 149-17.000.

Bennes Marrel: *See*—
Tardy, Maurice; and Paulet, Jean, 4,122,864, Cl. 137-625.600.

Bennett, George T.; and Brucken, Byron L., to General Motors Corporation. Electromagnetic clutch. 4,122,930, Cl. 192-84.00C.

Benoy, Gaston J.: *See*—
Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.

Berg, Alan, to United States of America, Navy. Disconnect linkage for force transmission system. 4,122,927, Cl. 192-48.800.

Berger, Alfred: *See*—
Abel, Heinz; and Berger, Alfred, 4,123,378, Cl. 252-171.000.

Bergfeld, Manfred: *See*—
Zengel, Hans-Georg; and Bergfeld, Manfred, 4,123,461, Cl. 260-558.00A.

Berghmans, Jacques M. L.; and Vary, Eva M., to Du Pont de Nemours, E. I., and Company. Finishes having improved scratch resistance prepared from compositions of fluoropolymer, mica particles or metal flake, a polymer of monoethylenically unsaturated monomers and a liquid carrier. 4,123,401, Cl. 260-29.60F.

Berglund, Kjell W.; and Nordlund, Karl S. Automotive goods-transport vehicle. 4,122,963, Cl. 214-512.000.

Berglund, Svante O.: *See*—
Andersson, Rune S.; and Berglund, Svante O., 4,123,239, Cl. 55-379.000.

Beriger, Ernst, to Ciba-Geigy Corporation. 2,2-Disubstituted-phenylcarbamoyl-6-hydroxy-m-dioxin-4-one derivatives having insecticidal properties. 4,123,551, Cl. 424-279.000.

Berkenblit, Melvin: *See*—
Balog, Moshe; Berkenblit, Melvin; Chan, See-Ark; and Reisman, Arnold, 4,123,571, Cl. 427-249.000.

Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., to American Cyanamid Company. Novel 11-hydroxy-9-keto-5,6-cis-13,14-cis-prostadienoic acid derivatives. 4,123,456, Cl. 562-503.000.

Bernardi, Luigi; Elli, Carlo; Falconi, Giovanni B.; and Ferrari, Rosella, to Societa Farmaceutici Italia S.p.A. Substituted pyrazines as inhibitors of platelet aggregation. 4,123,613, Cl. 544-408.000.

Bernewasser, Horst: *See*—
Scholl, Hans; and Bernewasser, Horst, 4,122,785, Cl. 112-121.150.

Bernstein, Seymour: *See*—
Conrow, Ransom B.; and Bernstein, Seymour, 4,123,455, Cl. 260-507.00R.

Berriman, Lester P., to Dresser Industries, Inc. Automotive exhaust gas recirculation valve. 4,122,810, Cl. 123-119.00A.

Bertolini, Natale; Divo, Claudio; Maris, Petri; and Maiorano, Giovanni. Olefin production process. 4,123,471, Cl. 260-683.15C.

Best, Donald C., to Union Carbide Corporation. Amination process using nickel-rhenium catalysts. 4,123,462, Cl. 260-585.00B.

Best, John S.: *See*—
McCaldin, James O.; and Best, John S., 4,123,295, Cl. 148-33.000.

Betts, Joseph E.; and Holub, Fred F., to General Electric Company. Flame-resistant composition, and electrical product thereof. 4,123,586, Cl. 428-391.000.

Bevington, John F.; Savidge, Michael; and Meeker, Paul, to National Super Service Company, The. High-speed floor treating machine. 4,122,576, Cl. 15-49.00R.

BFG Glassgroup: *See*—
Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,123,244, Cl. 65-60.00C.

Bhalla, Ranbir S., to Westinghouse Electric Corp. HID lamp electrode comprising solid solution of dibarium calcium molybdate and tungstate. 4,123,685, Cl. 313-218.000.

Bhopale, Arvind M.: *See*—
Stuart, Richard L.; and Bhopale, Arvind M., 4,123,710, Cl. 325-38.00A.

Bianchi, S.A.: *See*—
Casado, Fernando, 4,123,050, Cl. 273-1.00E.

Bieringer, Harold F.; Jones, Derrell G.; and Schwartzkopf, Gary S., to Caterpillar Tractor Co. Service support. 4,122,758, Cl. 92-23.000.

Bird, Alfred J.: *See*—
Acres, Gary J. K.; and Bird, Alfred J., 4,123,500, Cl. 423-35.000.

Birkmeyer, William J.: *See*—
Erikson, J. Alden; and Birkmeyer, William J., 4,123,422, Cl. 528-273.000.

Bish, James R.: *See*—
Atkins, Larry P.; and Bish, James R., 4,122,890, Cl. 164-444.000.

Biskup, Edward J., to General Motors Corporation. Occupant propelled cambering vehicle. 4,123,079, Cl. 280-220.000.

Bissett, Larry A.: *See*—
Capp, John P.; and Bissett, Larry A., 4,122,897, Cl. 166-256.000.

Bitha, Panayota: *See*—
Hlavka, Joseph J.; and Bitha, Panayota, 4,123,607, Cl. 536-17.000.

Bizerba-Werke Wilhelm Kraut KG: *See*—
Hartmann, Ernst G.; Krech, Hans; and Meir, Franz, 4,123,749, Cl. 340-572.000.

Bjorklund, James Axel C.; and Ekengren, Turid, to KemaNobel AB. Process for sizing cellulose fibers. 4,123,319, Cl. 162-158.000.

Black, John W., to Pemco-Kalamazoo, Inc. Solid axle wheel support and sealed bearing construction. 4,122,580, Cl. 16-46.000.

Black, Paul G.: *See*—
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,122,755, Cl. 90-11.00A.

Black, Sivalls & Bryson, Inc.: *See*—
Wood, Loren E.; Witten, John E.; and Short, Edward H., III, 4,122,595, Cl. 29-424.000.

Blackett, John H., to Matburn (Holdings) Limited. Electrosurgical apparatus. 4,122,854, Cl. 128-303.130.

Blatt, David H., to Franklin Container Corporation. Roll holding carton. 4,122,949, Cl. 206-303.000.

Blazek, Jaroslav: *See*—
Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, 4,123,114, Cl. 302-53.000.

Block Engineering Inc.: *See*—
Hirschfeld, T.; and Brown, David C.A.G., 4,123,236, Cl. 55-197.000.

Bloor, Christopher: *See*—
Riley, Ralph V.; Muir, Samuel; Bloor, Christopher; and Jozsef, Tibor, 4,123,264, Cl. 75-211.000.

Bluestein, Claire: *See*—
Cowell, Richard D.; Loewrigkeit, Peter; Rosenblatt, William; and Bluestein, Claire, 4,123,421, Cl. 528-65.000.

Blunk, Glenn I. Acoustical texture applicator. 4,123,005, Cl. 239-327.000.

Bockelmann, Wilfried; and Steinbrink, Rainer, to Deutsche Vergaser GmbH & Co. Kg. Valve for adding extra air in an internal combustion engine. 4,122,806, Cl. 123-103.00R.

Boehringer Mannheim GmbH: *See*—
Hundt, Dieter; Gruber, Wolfgang; Klarwein, Michael; and Roeschlau, Peter, 4,123,384, Cl. 252-408.000.

Boeing Company, The: *See*—
Andersson, Anders O.; and Purves, Robert B., 4,122,674, Cl. 60-39.650.
Geithman, Glenn A.; and Woodmansee, Wayne E., 4,122,724, Cl. 73-588.000.
Hill, Horace E., 4,123,193, Cl. 408-202.000.
Newell, Stanley E., 4,122,722, Cl. 73-362.0AR.

Bohner, Beat; Dawes, Dag; and Meyer, Willy, to Ciba-Geigy Corporation. Process for preparing 1,2,4-triazole derivatives. 4,123,437, Cl. 260-308.00R.

Bolin, Philip C., to Westinghouse Electric Corp. Gas termination support system. 4,123,619, Cl. 174-19.000.

Bollen, Phillip S.: *See*—
Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, 4,123,473, Cl. 260-860.000.

Bollinger, Ralph L., Jr.: *See*—
Baird, William C., Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph L., Jr., 4,123,350, Cl. 208-108.000.

Bomco, Inc.: *See*—
Banks, Neill K., Jr., 4,123,177, Cl. 336-239.000.

Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., to Ford, Bacon & Davis Texas, Inc. Gas mixer and reactor. 4,123,220, Cl. 431-353.000.

Bonnefon, Alain; Coupard, Alain; and Maffre, Michel, to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes. Reinforced plastic material and a process for the production thereof. 4,123,476, Cl. 260-897.00A.

Borenstein, David E.; and Newton, Richard C., to Phillips Petroleum Company. Yarn processing apparatus. 4,122,588, Cl. 28-221.000.

Borg, Arthur N., to Magnavox Company, The. Automatic frequency control for digital tuning systems. 4,123,716, Cl. 325-464.000.

Borgran, Peter M. Device for extracting heat from a fireplace. 4,122,824, Cl. 126-121.000.

Borzak, Robert A., to Ampex Corporation. Tape reel container. 4,122,945, Cl. 206-395.000.

Boswell, Gary T.: *See*—
Dean, Lura C., Jr.; Boswell, Gary T.; Winkelman, Wayne; and Little, Frank S., 4,123,795, Cl. 364-200.000.

Botcherby, Stephen C. L.; and Starbuck, Christopher P., to Decca Limited. Optical path length modulator. 4,123,145, Cl. 350-269.000.
Botcherby, Stephen C. L.; Starbuck, Christopher P.; and Fitzherbert, Jeremy A., to Decca Limited. Optical detector of remote movement including cyclic scanning of target. 4,123,166, Cl. 356-152.000.
Botcherby, Stephen C. L.; and Fitzherbert, Jeremy A., to Decca Limited. Optical detecting system. 4,123,167, Cl. 356-152.000.
Botros, Raouf, to American Color & Chemical Corporation. Metal-modified polypropylene dyed with azomethine dyes derived from an 0-hydroxy aromatic aldehyde and a 2-aminopyridine. 4,123,223, Cl. 8-42.00D.
Bottrill, John; and Cunningham, Douglas J., to Britax (Wingard) Limited. Safety belt rewinding mechanism with improved retraction characteristics. 4,123,013, Cl. 242-107.000.
Boudreau, Archie E. Conduit coupling means for milking systems and method of making same. 4,123,035, Cl. 251-146.000.
Boulanger, Henry J.; and Rizzo, Salvatore P., to Texas Instruments Incorporated. Keyboard apparatus. 4,123,627, Cl. 200-5.00A.
Bourgeois, Ronald D. Automatic pick-up and release mechanism and agitator device. 4,123,289, Cl. 134-134.000.
Bourne, John B.: *See*—
Gagnier, Real; Bourne, John B.; and Terry, John B., 4,123,624, Cl. 179-15.0AT.
Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Apparatus for reading a radiation-reflecting record carrier. 4,123,652, Cl. 250-204.000.
Bovenlander, Johannes P.: *See*—
Comiskey, Gary F.; Hesse, Gregory N.; and Bovenlander, Johannes P., 4,123,674, Cl. 307-351.000.
Bovio, Michele, to Ing. C. Olivetti & C., S.p.A. Arrangement for detecting the angular position of a rotatable part. 4,123,653, Cl. 250-231.0SE.
Bowen, Leon O., Jr.; and McVean, Michael T., to Rangaire Corporation. Venting and recirculating vent kitchen hood. 4,122,835, Cl. 126-299.00D.
Bowler, Lauren L.; and Rice, John O., to General Motors Corporation. Digital closed loop fuel control system. 4,122,811, Cl. 123-119.0EC.
Bowles Fluidics Corporation: *See*—
Stouffer, Ronald D.; and Bray, Harry C., Jr., 4,122,845, Cl. 128-66.000.
Boyce, Peter H.: *See*—
Das, Tapan K.; Boyce, Peter H.; and Fletcher, Graham J., 4,123,724, Cl. 331-1.00A.
Boye, Albert A.: *See*—
Pickett, Wiley J.; and Boye, Albert A., 4,123,133, Cl. 339-273.00R.
Bozich, Robert, to Malton Electric Company. Weatherproof cabinet closure. 4,122,972, Cl. 220-331.000.
BP Chemicals Limited: *See*—
Clarkson, Michael J.; and Duffield, Robert, 4,122,684, Cl. 62-54.000.
Bradner, William T.: *See*—
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,123,608, Cl. 536-17.000.
Braly, Joseph M., to Con-Sole Golf Corporation. Method of making golf club shafts. 4,122,593, Cl. 29-407.000.
Brandelli, Anthony R. Extendible ballcock. 4,122,862, Cl. 137-437.000.
Brandenstein, Manfred: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,123,121, Cl. 308-6.00C.
Branson, Charles D.; and Demi, Roy C., to Robertshaw Controls Company. Fuel control system and control device therefor or the like. 4,123,036, Cl. 251-180.000.
Braukmann Armaturen AG: *See*—
Braukmann, Bernard W., 4,122,863, Cl. 137-557.000.
Braukmann, Bernard W., to Braukmann Armaturen AG. Differential pressure overflow valve. 4,122,863, Cl. 137-557.000.
Braun, Erwin, to Sigloch and Schrieder. Multi-spindle drill head. 4,123,191, Cl. 408-42.000.
Braverman, Milton. Apparatus and method for filling medicinal dispensing devices. 4,122,651, Cl. 53-390.000.
Bray, Harry C., Jr.: *See*—
Stouffer, Ronald D.; and Bray, Harry C., Jr., 4,122,845, Cl. 128-66.000.
Bray, Thomas L.: *See*—
Smith, Bob R.; West, Harold L.; Bray, Thomas L.; and Wilder, Robert H., Sr., 4,122,877, Cl. 144-208.00E.
Brenner, Gunter: *See*—
Credner, Karl; Brenner, Gunter; Tauscher, Manfred; and Jozic, Ljerka, 4,123,534, Cl. 424-253.000.
Breshears, Robert R.: *See*—
Fitzgerald, Dennis J.; and Breshears, Robert R., 4,122,816, Cl. 123-148.0DC.
Brewer, David C.; Evans, James D.; Kohler, Dale M.; and Haselkorn, Michael H., to Armco Steel Corporation. Method of improving the surface insulation resistance of electrical steels having an insulative coating thereon. 4,123,337, Cl. 204-129.300.
Brewton, Lee K., to Southwire Company. Method for reclaiming processed thermosetting plastic compounds. 4,123,584, Cl. 428-379.000.
Brickman, Harold, to Ever-Wear, Inc. Foldable bar-table. 4,122,780, Cl. 108-25.000.
Bridger, Robert F.; and Landis, Phillip S., to Mobil Oil Corporation. Lubricant compositions containing antioxidants. 4,123,372, Cl. 252-48.200.
Bridges, James R.: *See*—
Brown, Winthrop K.; Bridges, James R.; and Savage, Kerry D., 4,122,709, Cl. 73-136.00A.
Bridgestone Tire Company Limited: *See*—
Takigawa, Hiroyoshi; Watanabe, Shigeo; Aoki, Shigeta; and Ogawa, Hiroshi, 4,122,879, Cl. 152-209.00R.
Tanaka, Mamoru, 4,123,088, Cl. 285-14.000.
Bridon Engineering Limited: *See*—
Gillespie, Peter J., 4,123,037, Cl. 251-367.000.
Brieaddy, Lawrence E.: *See*—
Mehta, Nariman B.; and Brieaddy, Lawrence E., 4,123,555, Cl. 424-330.000.
Brieger, Emmet F. Well perforator with anchor and method. 4,122,899, Cl. 166-297.000.
Brill, Harry M. Golf clubs. 4,123,055, Cl. 273-77.00A.
Bristol-Myers Company: *See*—
Buchanan, Ronald L.; Woolever, John T.; and Jelenevsky, Alex M., 4,123,440, Cl. 260-326.280.
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,123,608, Cl. 536-17.000.
Britax (Wingard) Limited: *See*—
Bottrill, John; and Cunningham, Douglas J., 4,123,013, Cl. 242-107.000.
British Steel Corporation: *See*—
Laws, William R.; and Winkworth, David A., 4,122,894, Cl. 165-76.000.
Riley, Ralph V.; Muir, Samuel; Bloor, Christopher; and Jozsef, Tibor, 4,123,264, Cl. 75-211.000.
Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Lactone polyol esters as oleaginous additives. 4,123,373, Cl. 252-48.600.
Brokaw, Adrian P.: *See*—
Timko, Michael P.; and Brokaw, Adrian P., 4,123,698, Cl. 323-1.000.
Brook, Richard M., to Auto Systems Limited. Method and apparatus for grading articles. 4,122,953, Cl. 209-551.000.
Brotzmann, Karl: *See*—
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans G., 4,123,259, Cl. 75-60.000.
Brouard, Claude M. H. E.; and Ficht, Paulette G., to Produits Chimiques Ugine Kuhlmann. 1:1 Chromiferous complex azo compounds having a bidentate chelating group and a monofunctional neutral ligand. 4,123,429, Cl. 260-147.000.
Brougham, William K., to Welding Industries of Australia Pty. Ltd. Leakage reactance transformer. 4,123,736, Cl. 336-120.000.
Brown, Arnold E. Lumber forming attachment for chain saws. 4,122,604, Cl. 30-371.000.
Brown, David B.; Vickers, Jerry W.; and Pell, Kynric M., to United States of America, Army. Attitude determination using two color, dual-sweeping laser system. 4,123,165, Cl. 356-152.000.
Brown, David C.A.G.: *See*—
Hirschfeld, T.; and Brown, David C.A.G., 4,123,236, Cl. 55-197.000.
Brown, Graydon L.: *See*—
Fair, Delbert W.; and Brown, Graydon L., 4,122,909, Cl. 180-127.000.
Brown, Omar L., to Dayton Reliable Tool & Manufacturing Company. Method and apparatus for scoring an enameled metal surface. 4,122,791, Cl. 113-121.00C.
Brown, Winthrop K.; Bridges, James R.; and Savage, Kerry D., to Texaco Inc. Digital torque meter. 4,122,709, Cl. 73-136.00A.
Brucat, John N., to Instructional/Communications Technology, Inc. Advance mechanism. 4,123,153, Cl. 352-191.000.
Brucken, Byron L.: *See*—
Bennett, George T.; and Brucken, Byron L., 4,122,930, Cl. 192-84.00C.
Bruckenstein, Stanley: *See*—
Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,123,339, Cl. 204-149.000.
Bruning Bros. Co., Inc.: *See*—
Azzara, Anthony A., 4,122,594, Cl. 29-408.000.
Bryant, Raymond G., Jr.; and Cockrell, Clifford M., to Freeport Minerals Company. Integrated sulfur mining - sulfuric acid production system. 4,123,107, Cl. 299-6.000.
Bucalo, Louis. Apparatus for providing living beings with absorbable implants. 4,122,850, Cl. 128-216.000.
Buchan, William A.: *See*—
Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer E., 4,123,773, Cl. 358-4.000.
Buchanan, Ronald L.; Woolever, John T.; and Jelenevsky, Alex M., to Bristol-Myers Company. Bicyclo [2.2.1]-heptane-2,3,di-endo-carboxylic acid imide esters. 4,123,440, Cl. 260-326.280.
Buchy, James P., to Plibrico (Canada) Limited. Refractory liner block. 4,122,642, Cl. 52-511.000.
Buck Tool Company: *See*—
Rosewarne, William V.; and Norton, Gerald W., 4,123,075, Cl. 279-121.000.
Buckley, Peter J.: *See*—
Davey, Christopher R.; and Buckley, Peter J., 4,123,377, Cl. 252-103.000.
Bucknall, Arthur H. Lifting tackle. 4,123,041, Cl. 254-195.000.
Bud Antle, Inc.: *See*—
Abey, John A., 4,123,495, Cl. 264-318.000.
Budzich, Tadeusz. Load responsive valve assemblies. 4,122,677, Cl. 60-427.000.

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Burdorf, Donald L.: *See*—
Rotter, Gerhard; Bakowski, Alojzy; and Burdorf, Donald L., 4,123,791, Cl. 360-130.000.
Burke, Harry D., to Whirlpool Corporation. Air circulation system for microwave oven. 4,123,643, Cl. 219-10.55R.
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Burnett, Thomas W., to Nuclear Pacific, Inc. Shielding holder for radionuclid syringes. 4,122,836, Cl. 128-1.100.
Burns, Daniel E. Waste energy hot water heater. 4,122,801, Cl. 122-20.00B.
Burroughs Corporation: *See*—
Franke, Robert H., 4,122,995, Cl. 235-302.000.
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Mehta, Nariman B.; and Brieaddy, Lawrence E., 4,123,555, Cl. 424-330.000.
Burstein, William J. Control for mini tape recorder. 4,123,016, Cl. 242-201.000.
Busch, Gerhard: *See*—
Andres, Rudolf; Busch, Gerhard; and Heiss, Werner, 4,123,104, Cl. 297-391.000.
Bush Universal, Inc.: *See*—
Stanton, Leo F., 4,122,573, Cl. 12-18.300.
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Kuhlmann, Wolf; Rumpp, Gerhard; and Busler, Albert, 4,122,753, Cl. 85-74.000.
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Butler, Marlow Dole, to Tektronix, Inc. Modular electronic instrument cabinets. 4,123,129, Cl. 312-257.00R.
Buxbaum, Lothar, to Ciba-Geigy Corporation. Thermoplastic copolyesters. 4,123,454, Cl. 260-22.00D.
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Kramann, Bernhard; and Tammen, Heinrich, 4,122,591, Cl. 29-157.00R.
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Foley, Edward M.; Dreyer, Dennis G.; and Rogers, Herbert E., Jr., 4,123,266, Cl. 75-244.000.
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McCaldin, James O.; and Best, John S., 4,123,295, Cl. 148-33.000.
Rembaum, Alan; and Volksen, Willi, 4,123,396, Cl. 526-24.000.
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Silvestrini, Jesus A., 4,122,765, Cl. 99-551.000.
Calvin, Noel M. Automatic instrument tuner. 4,122,751, Cl. 84-454.000.
Cama, Lovji D.; and Christensen, Burton G., to Merck & Co., Inc. 3-(Substituted thio) cephalosporins, derivatives and nuclear analogues thereof. 4,123,528, Cl. 424-248.520.
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Corvi-Mora, Camillo, 4,123,530, Cl. 424-250.000.
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Chow, Sherman M., 4,123,711, Cl. 325-62.000.
Dodds, David E.; Sendyk, Andrzej M.; and Wohlberg, Donald B., 4,123,709, Cl. 325-38.00B.
Poapst, Peter A.; and Forsyth, Frank R., 4,123,558, Cl. 426-268.000.
Canavan, Richard J. Snow alarm. 4,122,660, Cl. 58-16.500.
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Viero, Laurence; Cannon, John; Rademaker, George; Swanson, Williard; and Fessett, Kenneth, 4,123,089, Cl. 285-39.000.
Canon, Inc.: *See*—
Hasegawa, Goro, 4,123,766, Cl. 354-51.000.
Canon Kabushiki Kaisha: *See*—
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.
Sekiguchi, Takeshi, 4,123,777, Cl. 358-55.000.
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Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,123,244, Cl. 65-60.00C.
Capp, John P.; and Bissett, Larry A., to United States of America, Energy. In situ gasification process for producing product gas enriched in carbon monoxide and hydrogen. 4,122,897, Cl. 166-256.000.
Caputo, Bernard; and Leonard, Donald A. Method and apparatus for remotely measuring sub-surface water temperatures. 4,123,160, Cl. 356-75.000.
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Coppola, John A.; Lawler, Harry A.; and McMurtry, Carl H., 4,123,286, Cl. 106-44.000.
Carl Still Recklinghausen, Firma: *See*—
Laufhutte, Dieter, 4,123,331, Cl. 201-4.000.
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Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., to Bendix Corporation, The. Duty cycle translator with solenoid modeling circuit for adaptive braking system. 4,123,116, Cl. 303-103.000.
Carpel, Emmett F. Surgical drape support. 4,122,848, Cl. 128-132.00D.
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Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., 4,122,926, Cl. 192-18.00A.
Carson, John C., Jr.: *See*—
Kenkare, Divaker B.; Robbins, Clarence R.; and Carson, John C., Jr., 4,122,976, Cl. 222-94.000.
Carter, Russell P., Jr.: *See*—
Heiss, Herbert L.; Yeater, Robert P.; and Carter, Russell P., Jr., 4,123,419, Cl. 260-45.8NZ.
Casado, Fernando, to Bianchi, S.A. Toy aircraft flight simulator. 4,123,050, Cl. 273-1.00E.
Cascone, Paul J., to Pennwalt Corporation. Dental gold alloy. 4,123,262, Cl. 75-165.000.
Casutt, Max, to Rohr Industries, Inc. Pierce rivet machine. 4,122,988, Cl. 227-53.000.
Catania, Salvadore. Golf shoe wiping attachment for golf club heads. 4,122,577, Cl. 15-160.000.
Caterpillar Mitsubishi Ltd.: *See*—
Kohriyama, Yoshimasa, 4,123,120, Cl. 305-41.000.
Caterpillar Tractor Co.: *See*—
Bieringer, Harold F.; Jones, Derrell G.; and Schwartzkopf, Gary S., 4,122,758, Cl. 92-23.000.
Cole, Carroll R., 4,122,903, Cl. 172-781.000.
Miers, Bruce W.; Proksch, Frederick D.; and Welker, Gerald H., 4,122,908, Cl. 180-68.00P.
Ryberg, John G., 4,122,820, Cl. 123-198.00E.
Stedman, Robert N., 4,122,959, Cl. 314-138.00R.
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Pressler, Kurt T.; and Cattell, Scott, 4,122,796, Cl. 116-132.00R.
Cave, Lawrence E., to PMC Industries, Inc. Profiled chip breaker. 4,123,194, Cl. 408-221.000.
Cawood, Charles D., Jr.: *See*—
Mosior, Donald J.; Cawood, Charles D., Jr.; and Ekinaka, Michael H., 4,122,856, Cl. 128-311.000.
Celio, Tino: *See*—
Graf, Jean-Pierre; and Celio, Tino, 4,123,778, Cl. 358-107.000.
Celms, Harry, to Roblin Industries, Inc. Display shelving. 4,122,955, Cl. 211-126.000.
Central Scientific Company, Inc.: *See*—
Andriulis, Vytautas, 4,123,201, Cl. 417-204.000.
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Stoy, Artur; and Urbanova, Renata, 4,123,406, Cl. 260-29.6AN.
Chace, Howard E.; and Szwarc, Anthony F., to American Optical Corporation. Lens power display in prescription form. 4,123,163, Cl. 356-124.000.
Chagnon, Maurice; and Lemery, Michel, to Delle-Alsthom S.A. Connector for testing an electric installation. 4,123,629, Cl. 200-51.00R.
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Balog, Moshe; Berkenblit, Melvin; Chan, See-Ark; and Reisman, Arnold, 4,123,571, Cl. 427-249.000.
Chana, Howard E., to General Motors Corporation. Hydromechanical mechanical continuously variable transmission. 4,122,732, Cl. 74-863.000.
Chandross, Edwin A.; and Pryde, Coralie A., to Bell Telephone Laboratories, Incorporated. Technique for promoting the solderability of a metal surface. 4,123,562, Cl. 427-58.000.
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Chapman, Harry L.: *See—*
Kingsbury, William L.; Thurston, Kelly W.; and Chapman, Harry L., 4,122,804, Cl. 123-32.0ST.
Charron, Francis, to Societe d'Etudes de Machines Thermiques. Method and means for pre-heating the intake air of a supercharged, low-compression ratio diesel engine when operating at low load. 4,122,679, Cl. 60-599.000.
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Chemetals Corporation: *See—*
Welsh, Jay Y.; and Sochol, Irving, 4,123,499, Cl. 423-35.000.
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Hilterhaus, Karl-Heinz; and Reuter, Franz G., 4,123,599, Cl. 521-123.000.
Chemisches Laboratorium Fritz-Walter Lange GmbH & Co KG: *See—*
Lange, Fritz-Walter; Jacobi, Haireddin; and Muller, Jens, 4,123,548, Cl. 424-274.000.
Chemtree Corporation: *See—*
Hall, William C.; and Peterson, John M., 4,123,392, Cl. 252-478.000.
Chen, Inan: *See—*
Von Hoene, Donald C.; Chu, Joseph Y. C.; Chen, Inan; and Jones, Robert N., 4,123,269, Cl. 96-1.0PC.
Chenausky, Peter P.; and Glenn, William H., to United Technologies Corporation. Unstable resonator having high magnification. 4,123,149, Cl. 350-294.000.
Cheney, Stanley O. Nordic ski track sled. 4,122,614, Cl. 37-10.000.
Cherry, Isaac R.; and Anderson, Donald L., to Del Mar Avionics. Recorder for cardiac signals with manually actuated event marking. 4,123,785, Cl. 360-6.000.
Chevron Research Company: *See—*
Bacskai, Robert, 4,123,605, Cl. 528-60.000.
Bakshi, Kiran R., 4,123,442, Cl. 260-346.750.
Clements, Luther D.; Hannan, Michael D.; Hinds, Robert J.; and Vose, Richard W., 4,123,357, Cl. 210-71.000.
Freenor, Francis J., III; and Koerber, Barbara M., 4,123,255, Cl. 71-103.000.
Frost, Kenneth A., Jr., 4,123,232, Cl. 44-72.000.
Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., 4,123,552, Cl. 424-311.000.
Chien, Ji-Peng: *See—*
Radkowsky, Alvin; Chien, Ji-Peng; Yang, Chao-Yie; and Hsieh, Horng-Ming, 4,123,328, Cl. 176-78.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, 4,123,533, Cl. 424-251.000.
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Robinson, Graham, 4,123,596, Cl. 429-104.000.
Chou, Cheng-Chien; and Rosebrock, Theodore L., to General Motors Corporation. Iris control for gas turbine engine air brake. 4,122,668, Cl. 60-39.16R.
Chow, Peter E. K., to Northern Telecom Limited. Digital regenerator having improving noise immunity. 4,123,625, Cl. 179-16.0EA.
Chow, Sherman M., to Canadian Patents and Development Limited. Synchronized compressor and expander voice processing system for radio telephone. 4,123,711, Cl. 325-62.000.
Christensen, Burton G.; and Walton, Edward, to Merck & Co., Inc. Thienamycin sulfoxide and sulphone. 4,123,547, Cl. 424-274.000.
Christensen, Burton G.: *See—*
Cama, Lovji D.; and Christensen, Burton G., 4,123,528, Cl. 424-248.520.
Chu, Joseph Y. C.: *See—*
Von Hoene, Donald C.; Chu, Joseph Y. C.; Chen, Inan; and Jones, Robert N., 4,123,269, Cl. 96-1.0PC.
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Abel, Heinz; and Berger, Alfred, 4,123,378, Cl. 252-171.000.
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Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,123,439, Cl. 260-326.50B.
Beriger, Ernst, 4,123,551, Cl. 424-279.000.
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 4,123,437, Cl. 260-308.00R.
Buxbaum, Lothar, 4,123,454, Cl. 260-22.00D.
Gilg, Bernard; Muller, Helmut; and Rody, Jean, 4,123,418, Cl. 260-45.8NT.
Havalda, Paul, 4,123,360, Cl. 210-216.000.
Karrer, Friedrich, 4,123,556, Cl. 424-341.000.
Loew, Peter, 4,123,222, Cl. 8-39.00A.
Cincinnati Steel Treating Company: *See—*
Dammel, Howard W.; Frantz, Robert M.; Luke, James H.; and Skrzypczyk, William G., 4,123,642, Cl. 219-10.590.
Cirincione, Thomas J.: *See—*
Bullock, Frederick C.; Engelhardt, Alvin; Cirincione, Thomas J.; and Williams, Joseph A., 4,123,173, Cl. 356-246.000.
Ciurca, Samuel, Jr.; and Kohrt, Carl F., to Eastman Kodak Company. Stable free radical nitroxyl bleaching agents for photographic processes. 4,123,273, Cl. 96-66.00T.
Clark, Bob J. Key for defrosting locks. 4,123,648, Cl. 219-521.000.
Clark Equipment Company: *See—*
Bauer, James J.; and Hoechst, Lonnie D., 4,122,960, Cl. 214-140.000.
Clark, John S.: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,122,755, Cl. 90-11.00A.
Clark, Keith H.: *See—*
Johnston, James D.; Tuggle, Richard H., Jr.; Burch, John L.; and Clark, Keith H., 4,122,991, Cl. 228-13.000.
Clarke, Anthony B.: *See—*
Roy, Alexander R.; and Clarke, Anthony B., 4,122,636, Cl. 51-298.00R.
Clarkson, Michael J.; and Duffield, Robert, to BP Chemicals Limited. Method for the recovery of volatile liquids. 4,122,684, Cl. 62-54.000.
Clayton, James W. B.: *See—*
Anderson, Gordon C.; and Clayton, James W. B., 4,122,655, Cl. 57-58.890.
Cleary, William I.: *See—*
Vild, Joseph P.; Cleary, William I.; and Fox, Donald P., 4,123,708, Cl. 324-224.000.
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Cochran, Larry A.; and Shanley, Robert L., II, to RCA Corporation. Service switch arrangement for a color television receiver. 4,123,776, Cl. 358-10.000.
Cockram, David R., to Pilkington Brothers Limited. Glass fibres for reinforcement of cement products. 4,123,287, Cl. 106-99.000.
Cockrell, Clifford M.: *See—*
Bryant, Raymond G., Jr.; and Cockrell, Clifford M., 4,123,107, Cl. 299-6.000.
Coggins, Thomas A.: *See—*
Barr, Donald H.; and Coggins, Thomas A., 4,122,900, Cl. 168-12.000.
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Colbert, Thomas E., Jr. Contraction resistant coupling for pipe lines carrying gases or fluids. 4,123,092, Cl. 285-187.000.
Coldren, Kenneth M.: *See—*
Neubert, Frederic B.; and Coldren, Kenneth M., 4,122,932, Cl. 193-5.000.
Cole, Carroll R., to Caterpillar Tractor Co. Motor grader circle drive. 4,122,903, Cl. 172-781.000.
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Baines, Eric; and Harvey, Kenneth, 4,123,517, Cl. 424-57.000.
Bauman, Robert A., 4,123,513, Cl. 424-54.000.
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Gaffar, Abdul, 4,123,512, Cl. 424-54.000.
Gray, Frederic W., 4,123,376, Cl. 252-99.000.
Kenkare, Divaker B.; Robbins, Clarence R.; and Carson, John C., Jr., 4,122,976, Cl. 222-94.000.
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Witt, Frank A., 4,122,616, Cl. 40-596.000.
Collins, Dwight D.: *See—*
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Colln, Reimer; and Sirrenberg, Wilhelm, to Bayer Aktiengesellschaft. Preparation of O, O-dimethyl-O-(2,2-dichlorovinyl)-thionophosphoric acid ester. 4,123,478, Cl. 260-986.000.
Columbia Ribbon & Carbon Manufacturing Co., Inc.: *See—*
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,123,569, Cl. 427-141.000.
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Schulz, Albert C., 4,123,210, Cl. 425-78.000.
Comiskey, Gary F.; Hesse, Gregory N.; and Bovenlander, Johannes P., to Sun Electric Corporation. Voltage peak short store system. 4,123,674, Cl. 307-351.000.
Commins, Alfred D.; Kindelvich, Frederick T.; and Schroter, Richard C., to Kaiser Aluminum & Chemical Corporation. Insulated tank jacketing system. 4,122,640, Cl. 52-248.000.
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Sasse, Wolfgang H. F.; and Teitei, Tsutomu, 4,123,219, Cl. 432-1.000.
Compagnie Honeywell Bull (Societe Anonyme): *See—*
Sery, Jacques; and Couture, Serge A. E., 4,122,769, Cl. 101-93.180.
Compagnie Neerlandaise de l'Azote (Societe Anonyme): *See—*
Van Hijfte, Willy H. P.; Vanmarcke, Luc A.; and Niks, Anton, 4,123,570, Cl. 427-222.000.
Complett S.p.A.: *See—*
Conti, Roberto, 4,122,787, Cl. 112-170.000.
Con-Sole Golf Corporation: *See—*
Braly, Joseph M., 4,122,593, Cl. 29-407.000.
Conner, Joe D. Positionally adjustable lawn mower hitch. 4,123,082, Cl. 280-467.000.
Conner, William C., Jr.: *See—*
Pieters, Wim J. M.; Carlson, Emery J.; Gates, William E.; and Conner, William C., Jr., 4,123,389, Cl. 252-441.000.
Connor, David T.; Young, Patricia A.; and Von Strandtmann, Maximilian, to Warner-Lambert Company. Dialkyl ({[3-(alkoxycarbonyl)-1,4-dihydro-4-oxo-8-quinolinyl]amino}methylene)propanedioates. 4,123,536, Cl. 424-258.000.
Conrow, Ransom B.; and Bernstein, Seymour, to American Cyanamid Company. Phenenyltris(carbonylimino) multi-anionic substituted triphenyl acids and salts. 4,123,455, Cl. 260-507.00R.

Consolidated Foods Corporation: *See*—
Salzmann, Ferdinand F., 4,122,884, Cl. 160-168.00R.
Conti, Roberto, to Complett S.p.A. Sewing method and machine. 4,122,787, Cl. 112-170.000.
Continental Can Company, Inc.: *See*—
Keinanen, Henry J., 4,123,646, Cl. 219-137.00R.
Continental Oil Company: *See*—
Fair, Delbert W.; and Brown, Graydon L., 4,122,909, Cl. 180-127.000.
Kleinpeter, Joseph A., 4,123,448, Cl. 260-449.00M.
Miller, Edsel L.; and Krenowicz, Robert A., 4,123,369, Cl. 252-32.70E.
Conwed Corporation: *See*—
Larsen, Ronald L., 4,123,491, Cl. 264-167.000.
Sundin, George H., 4,123,314, Cl. 156-505.000.
Cook, Francis J.; and Kline, Frederick E., to Avco Everett Research Laboratory, Inc. High density beam-accessed memory with reference target. 4,123,798, Cl. 365-237.000.
Coombs, John F. Folding shelving. 4,122,782, Cl. 108-111.000.
Cooper, Glenn D.; and Litz, Donald C., to Westinghouse Electric Corp. Rotor member for superconducting generator. 4,123,676, Cl. 310-52.000.
Coors Container Company: *See*—
Vischer, Peter; and Artzer, Paul J., 4,122,937, Cl. 198-408.000.
Copal Company Limited: *See*—
Miyasaka, Takao, 4,123,679, Cl. 310-266.000.
Coppola, John A.; Lawler, Harry A.; and McMurtry, Carl H., to Carborundum Company, The. Silicon carbide powder compositions. 4,123,286, Cl. 106-44.000.
Coran, Aubert Y., to Monsanto Company. Plasticized composition of copolyetherester elastomer and aromatic sulfonamide. 4,123,411, Cl. 260-30.80R.
Corvi-Mora, Camillo, to Camillo Corvi S.p.A. N-cyclohexyl-piperazino acetamides and propionamides. 4,123,530, Cl. 424-250.000.
Cosentino, Louis C.; and Springrose, B. Steven, to Renal Systems, Inc. Tube connector. 4,123,091, Cl. 285-39.000.
Cossin, Russell N.: *See*—
Ellis, Larry C.; Ellis, John S.; and Cossin, Russell N., 4,122,923, Cl. 188-285.000.
Coster Tecnologie Speciali S.p.A.: *See*—
Giuffredi, Giancarlo, 4,122,982, Cl. 222-321.000.
Costin, Darryl J., to Owens-Corning Fiberglas Corporation. Platinum-rhodium alloys. 4,123,263, Cl. 75-172.00R.
Coupard, Alain: *See*—
Bonnefon, Alain; Coupard, Alain; and Maffre, Michel, 4,123,476, Cl. 260-897.00A.
Couture, Serge A. E.: *See*—
Sery, Jacques; and Couture, Serge A. E., 4,122,769, Cl. 101-93.180.
Cowell, Richard D.; Loewrigkeit, Peter; Rosenblatt, William; and Bluestein, Claire, to Witco Chemical Corporation. Stable tertiary amine containing terminally unsaturated polyurethane resins. 4,123,421, Cl. 528-65.000.
Craft, John W.: *See*—
Crunk, Elmer Kenneth; and Craft, John W., 4,123,034, Cl. 249-156.000.
Craig, Robert G. Protective eye shield for surgical patients. 4,122,847, Cl. 128-132.00R.
Cramer, Rudy R., to U.S. Philips Corporation. X-ray examining device comprising a television chain which includes a memory. 4,123,786, Cl. 360-35.000.
Crane-Veyor Corporation: *See*—
Batcheller, Roy W., 4,122,631, Cl. 49-394.000.
Creative Inventions: *See*—
Furyk, Robert C.; and Gow, Jon E. P., 4,123,058, Cl. 273-87.00H.
Credali, Lino; and Guidotti, Vincenzo, to Montedison S.p.A. Polymeric piperazinamides and membranes for reverse osmosis made therefrom. 4,123,424, Cl. 528-337.000.
Credner, Hans-Heinrich: *See*—
Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.
Credner, Karl; Brenner, Gunter; Tauscher, Manfred; and Jozic, Ljerka, to Wulfing, Johann W. Adenine derivatives and hypolipidemic composition thereof. 4,123,534, Cl. 424-253.000.
Cremerius, Willi. Sealing bead for use at high temperatures. 4,123,073, Cl. 277-229.000.
Cromer, Charles F.; Yoon, Kue H.; and Freeman, Willie B., to Westinghouse Electric Corp. Double-flow puffer-type single-pressure compressed-gas circuit-interrupter. 4,123,636, Cl. 200-148.00A.
Cross, Arthur A.: *See*—
Dussault, Edmund J.; Kochis, August J.; and Cross, Arthur A., 4,122,887, Cl. 160-354.000.
Croup, Robert E., to Acoustic Fiber Sound Systems, Inc. Loudspeaker assembly. 4,122,911, Cl. 181-199.000.
Crowell, Florence S.; and Hicks, Janice R. Three dimensional doll. 4,122,628, Cl. 46-135.00R.
Crown Cork & Seal Company, Inc.: *See*—
Potts, Vinson S., 4,122,971, Cl. 220-268.000.
Cruise, Claude R., Jr. Kite load-releasing messenger. 4,123,021, Cl. 244-155.00R.
Crunk, Elmer Kenneth; and Craft, John W., to BC Pausch, Inc. Box form for concrete culvert. 4,123,034, Cl. 249-156.000.
Cubbison, Richard J., Jr., to Bell Telephone Laboratories, Incorporated. Operational amplifier decoupling circuit. 4,123,722, Cl. 330-85.000.
Cunningham, Douglas J.: *See*—
Bottrill, John; and Cunningham, Douglas J., 4,123,013, Cl. 242-107.000.
Curran, D. Michael: *See*—
Jarrett, Ronald T.; and Barrett, Edward J., 4,122,767, Cl. 100-35.000.
Cushing, George B.; and Kothmann, Richard E., to Westinghouse Electric Corp. Vapor-cooled terminal-bushings for oil-type circuit-interrupters. 4,123,618, Cl. 174-11.0BH.
Custom Concepts, Incorporated: *See*—
Kubiatowicz, James F., 4,122,627, Cl. 46-92.000.
Cutler-Hammer, Inc.: *See*—
Hults, Harold W., 4,123,634, Cl. 200-67.00A.
D. H. Baldwin Company: *See*—
Uetrecht, Dale M., 4,122,744, Cl. 84-1.250.
Dahab, Richard E.; and Pollack, Howard M., to Singer Company, The. Piezo-electric line of sight corrector for inertial platform stabilized sensor in a stellar navigational system. 4,123,136, Cl. 350-16.000.
Dahlgren, Harold P. Hydrostatic bearer for printing press. 4,122,772, Cl. 101-218.000.
Dahlstrom, Norris A.: *See*—
Kohler, Dale M.; Dahlstrom, Norris A.; and Taylor, David W., 4,123,298, Cl. 148-111.000.
Daiichi Kasei Sangyo: *See*—
Katayama, Masao; and Tabeta, Yataro, 4,123,426, Cl. 260-112.00R.
Daiichi Koshuha Kogya Kabushiki Kaisha: *See*—
Hanyo, Susumu; Yamaguchi, Jousuke; Morishita, Yoshiyuki; and Noguchi, Itoshi, 4,122,697, Cl. 72-128.000.
Daimler-Benz Aktiengesellschaft: *See*—
Andres, Rudolf; Busch, Gerhard; and Heiss, Werner, 4,123,104, Cl. 297-391.000.
Renz, Udo D.; and Memmhardt, Dieter, 4,123,111, Cl. 301-37.0TP.
D'Ambra, Grace. Portable food warmer. 4,122,764, Cl. 99-483.000.
Dammel, Howard W.; Frantz, Robert M.; Luke, James H.; and Skrzypczyk, William G., to Cincinnati Steel Treating Company; and General Electric Company. Apparatus for induction hardening gear teeth. 4,123,642, Cl. 219-10.590.
Dana Corporation: *See*—
Sharpe, Robert L., 4,123,072, Cl. 277-216.000.
Danford, Tiras J., to Harrington Manufacturing Company. Bulk tobacco curing and drying structure. 4,123,221, Cl. 432-152.000.
Daniel, Richard A., to United States of America, Navy. Method of making tuned resonance passive electronic filters. 4,123,732, Cl. 333-70.00R.
Daniel, Thomas M. Method for the purification of mycobacterial protein antigens and resulting product. 4,123,427, Cl. 260-112.00B.
Danks, John. Sawhorse legs. 4,122,918, Cl. 182-181.000.
Dannelly, Clarence C., to Eastman Kodak Company. Encapsulating apparatus. 4,123,206, Cl. 425-5.000.
Darias Paya, Francisco J. Stringed musical instrument with auxiliary strings. 4,122,745, Cl. 84-267.000.
Darragh, Donald R., to Snow, James V. Pyramidal hanger for plants or like ornaments. 4,123,025, Cl. 248-303.000.
Das, Tapan K.; Boyce, Peter H.; and Fletcher, Graham J., to Plessey Handel und Investments AG. Communication equipment. 4,123,724, Cl. 331-1.00A.
Dastur, Khurshid P.: *See*—
Skorianetz, Werner; Dastur, Khurshid P.; and Strickler, Hugo, 4,123,394, Cl. 252-522.000.
Daswick, Alexander C.: *See*—
Landry, Archie C.; and Daswick, Alexander C., 4,123,102, Cl. 297-270.000.
Datta, Chander: *See*—
Lindahl, Herbert S.; and Datta, Chander, 4,122,686, Cl. 62-81.000.
Davey, Christopher R.; and Buckley, Peter J., to Procter & Gamble Company, The. Particulate detergent composition containing dibasic magnesium hypochlorite. 4,123,377, Cl. 252-103.000.
David, Agoston: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, 4,123,533, Cl. 424-251.000.
Davidson, Charles P. D.; and Philips, Edward G., to Lucas Industries Limited. Electrically assisted cycles. 4,122,907, Cl. 180-33.00C.
Davis, Abraham D.; and Pinter, Kenneth W., to A. B. Dick Company. Self-adhering stencil. 4,123,581, Cl. 428-318.000.
Davis, Donald C., to Bendix Autolite Corporation. Two fire ceramic sealed oxygen sensing device and method of forming same. 4,123,344, Cl. 204-195.00S.
Davis, Jesse B. Method and apparatus for reeling discrete yarn strand patterns. 4,122,703, Cl. 73-37.700.
Davis, Manfred, to Transcience Industries, Inc. Phase locked loop system. 4,123,725, Cl. 331-8.000.
Davy-Loewy Limited: *See*—
Maltby, Jack, 4,122,740, Cl. 83-646.000.
Dawes, Dag: *See*—
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 4,123,437, Cl. 260-308.00R.
Dayton Reliable Tool & Manufacturing Company: *See*—
Brown, Omar L., 4,122,791, Cl. 113-121.00C.
Dean, Lura C., Jr.; Boswell, Gary T.; Winkelman, Wayne; and Little, Frank S., to Texas Instruments Incorporated. Control system for a stored program multiprocessor computer. 4,123,795, Cl. 364-200.000.
DeBolt, Harold E., to Avco Corporation. Filamentary reinforcement product. 4,123,583, Cl. 428-336.000.

Decca Limited: *See*—
Botcherby, Stephen C. L.; and Starbuck, Christopher P., 4,123,145, Cl. 350-269.000.
Botcherby, Stephen C. L.; Starbuck, Christopher P.; and Fitzherbert, Jeremy A., 4,123,166, Cl. 356-152.000.
Botcherby, Stephen C. L.; and Fitzherbert, Jeremy A., 4,123,167, Cl. 356-152.000.

Decker, Bert J. Wave energy generator-breakwater-barge-dock. 4,123,667, Cl. 290-53.000.

Dee, Inc.: *See*—
Ellinger, Earl H., 4,123,081, Cl. 280-463.000.

Deere & Company: *See*—
Harbert, Jimmy D.; and Hansen, Harold V., 4,122,974, Cl. 221-13.000.

Dejoux, Andre: *See*—
Leclerc du Sablon, Bruno; and Dejoux, Andre, 4,123,787, Cl. 360-74.000.

Del Mar Avionics: *See*—
Cherry, Isaac R.; and Anderson, Donald L., 4,123,785, Cl. 360-6.000.

Del Monte Corporation: *See*—
Ross, Edward E., 4,122,875, Cl. 141-11.000.

Delaporte, Jean-Charlemagne, to S.A. dite Compagnie Generale de Chauffe. Devices for heating premises by the use of heat pumps and method therefor. 4,122,892, Cl. 165-12.000.

Della Torre, Arturo: *See*—
Melloni, Piero; Della Torre, Arturo; Lauria, Francesco; Passerini, Norina; Rossi, Alessandro; and Tommasini, Raffaele, 4,123,527, Cl. 424-244.000.

Delle-Alsthom S.A.: *See*—
Chagnon, Maurice; and Lemery, Michel, 4,123,629, Cl. 200-51.00R.

Demag A.G.: *See*—
Dietrich, Udo, 4,122,777, Cl. 104-89.000.

deMauriac, Richard A.: *See*—
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., 4,123,274, Cl. 96-66.00T.

Demi, Roy C.: *See*—
Branson, Charles D.; and Demi, Roy C., 4,123,036, Cl. 251-180.000.

De Napoli, Vincent. Tool box. 4,122,944, Cl. 206-349.000.

Denka Chemical Corporation: *See*—
Kerr, Ralph O.; and Barone, Bruno J., 4,123,388, Cl. 252-437.000.

Denson, Richard E. Food stuffs holder and cutter assembly. 4,122,737, Cl. 83-268.000.

Dentsply Research and Development Corporation: *See*—
Gonser, Donald I., 4,123,673, Cl. 307-326.000.

Deremo, Edwin J.; and Olving, Hans P., to Gardner-Denver Company. Control system for peck drilling tool. 4,123,188, Cl. 408-17.000.

Derrickson, Charles H.: *See*—
Dubuit, Jean-Louis; and Derrickson, Charles H., 4,122,768, Cl. 101-39.000.

Dervin, Edward: *See*—
Kilshaw, James, deceased; and Dervin, Edward, 4,123,768, Cl. 354-292.000.

Deuterium Corporation: *See*—
Spevack, Jerome S., 4,123,506, Cl. 423-566.000.

Deutsch, Ralph, to Deutsch Research Laboratories, Ltd. Transient voice generator. 4,122,742, Cl. 84-1.110.

Deutsch Research Laboratories, Ltd.: *See*—
Deutsch, Ralph, 4,122,742, Cl. 84-1.110.

Deutsche Vergaser GmbH & Co. Kg: *See*—
Bockelmann, Wilfried; and Steinbrink, Rainer, 4,122,806, Cl. 123-103.00R.

Devine, William T.; and Washburn, William F., to International Business Machines Corporation. Logical OR circuit for programmed logic arrays. 4,123,669, Cl. 307-205.000.

De Volder, Noel J.: *See*—
Gilliams, Yvan K.; De Volder, Noel J.; De Winter, Walter F.; and Tavernier, Bernard H., 4,123,374, Cl. 252-62.10L.

De Winter, Walter F.: *See*—
Gilliams, Yvan K.; De Volder, Noel J.; De Winter, Walter F.; and Tavernier, Bernard H., 4,123,374, Cl. 252-62.10L.

Diamond Shamrock Corporation: *See*—
Ihde, Frederick J., Jr., 4,123,383, Cl. 252-321.000.
Kennedy, Alexander W., 4,123,290, Cl. 148-6.200.

DiCicco, William R., Jr.: *See*—
Addicks, Lyle F.; Gift, Bennie; and DiCicco, William R., Jr., 4,122,564, Cl. 4-326.000.

Dick, Louis A.: *See*—
Kemper, Daryl M.; and Dick, Louis A., 4,123,680, Cl. 310-320.000.

Dick, Thomas H.: *See*—
Queen, David S.; Bell, Peter W.; Dick, Thomas H.; and Edgar, John B., 4,123,313, Cl. 156-498.000.

Dickore, Karlfried: *See*—
Hack, Helmut; Schmidt, Robert R.; and Dickore, Karlfried, 4,123,253, Cl. 71-93.000.

Dieterich, Dieter: *See*—
Wenzel, Wolfgang; and Dieterich, Dieter, 4,123,423, Cl. 528-71.000.

Dietrich, Udo, to Demag A.G. Railway maintenance car. 4,122,777, Cl. 104-89.000.

Dietz, Henry G. Cup supporter with removable elastic hip band. 4,122,849, Cl. 128-158.000.

Diggs, Edward J.; and Grebe, Karl, to Rockwell International Corporation. Flexible seal for brakes. 4,122,921, Cl. 188-79.5GE.

Di Liberto, Menno; and Parisi, Joseph P. Water shower unit. 4,122,558, Cl. 4-145.000.

DiNinno, Frank P., to Merck & Co., Inc. 6-Ethylpenicillanic acid. 4,123,539, Cl. 424-270.000.

DiPeri, Leonard J. Solar energy collector for direct air heating. 4,122,828, Cl. 126-270.000.

Di Rosa, Getano, to F.A.T.A - Fabbrica Apparecchi Di Sollevamento E Trasporto Ed Affint S.p.A. Damped suspended conveyor trolley. 4,122,778, Cl. 104-172.00S.

DiTillio, Ralph: *See*—
Mac Intyre, Robert W.; Wysocki, Edward J.; Orifice, Philip; and DiTillio, Ralph, 4,123,630, Cl. 200-52.00R.

Divo, Claudio: *See*—
Bertolini, Natale; Divo, Claudio; Maris, Petri; and Maiorano, Giovanni, 4,123,471, Cl. 260-683.15C.

Dixon, Bernard, to Dixon International Limited. Draught and weather sealing arrangements. 4,122,632, Cl. 49-470.000.

Dixon International Limited: *See*—
Dixon, Bernard, 4,122,632, Cl. 49-470.000.

Doane, Elliott P.: *See*—
Campbell, Ramsey G.; Doane, Elliott P.; Heines, M. Henry; Naworski, Joseph S.; and Vogt, Harvey J., 4,123,467, Cl. 260-659.00A.

Dodd, Anita A. Method of reducing drag and rotating torque in the rotary drilling of oil and gas wells. 4,123,367, Cl. 252-8.50B.

Dodds, David E.; Sendyk, Andrzej M.; and Wohlberg, Donald B., to Canadian Patents and Development Limited. Adaptive digital delta modulation for voice transmission. 4,123,709, Cl. 325-38.00B.

Doehler, Peter: *See*—
Baumgartner, Erich R.; and Doehler, Peter, 4,122,615, Cl. 38-93.000.

Doerner, Frank. Chair control for a tiltable stenographer's chair. 4,123,103, Cl. 297-305.000.

Donald P. Massa & Fred M. Dellorfano, Jr. Trustees of The Stonleigh Trust u/d/t: *See*—
Massa, Frank, 4,123,567, Cl. 427-123.000.

Dorer, Gary L., to Minnesota Mining and Manufacturing Company. Photoconductive element having a barrier layer of aluminum hydroxyoxide. 4,123,267, Cl. 96-1.0PC.

Doring, Erich. Elastic street delineator. 4,122,795, Cl. 116-63.00R.

Dorr, Hans W.; and Grosse, Ludwig, to Hoechst Aktiengesellschaft. Paper for serving cable cores. 4,123,593, Cl. 428-535.000.

Dose, Werner. Device for tanning, dyeing or the like. 4,122,692, Cl. 69-30.000.

Dow Chemical Company, The: *See*—
Grinstead, Robert R.; Jones, Kenneth C.; and Nasutavicus, Wilmonte A., 4,123,435, Cl. 260-307.00D.
Nelson, Wayne F., 4,122,898, Cl. 166-325.000.
Warner, Gregory L.; and Leng, Douglas E., 4,123,403, Cl. 260-29.2EP.

Dow Corning Corporation: *See*—
Sandford, Robert W., Jr., 4,123,604, Cl. 528-31.000.

Doyle, Terrence W.: *See*—
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., 4,123,608, Cl. 536-17.000.

Dragerwerk Aktiengesellschaft: *See*—
Heim, Ulrich; Leichnitz, Kurt; and Wiesner, Peter, 4,123,227, Cl. 23-232.00R.

Dragt, Jan C. W., to U.S. Philips Corporation. Electrically controllable pivoting mirror arrangement. 4,123,146, Cl. 350-285.000.

Drake, Cyril F., to International Standard Electric Corporation. Controlled release fertilizer. 4,123,248, Cl. 71-4.000.

Dresser Europe S.A.: *See*—
Parrott, George A.; and Norris, John B., 4,123,110, Cl. 299-43.000.

Dresser Industries, Inc.: *See*—
Berriman, Lester P., 4,122,810, Cl. 123-119.00A.

Dreyer, Dennis G.: *See*—
Foley, Edward M.; Dreyer, Dennis G.; and Rogers, Herbert E., Jr., 4,123,266, Cl. 75-244.000.

Dubin, Robert R.· *See*—
Chatterji, Debajyoti; and Dubin, Robert R., 4,123,566, Cl. 427-115.000.

Dubuit, Jean-Louis; and Derrickson, Charles H., to Dubuit of America, Inc. Screen printing press attachment for printing objects of revolution. 4,122,768, Cl. 101-39.000.

Dubuit of America, Inc.: *See*—
Dubuit, Jean-Louis; and Derrickson, Charles H., 4,122,768, Cl. 101-39.000.

Dudley, Vernon E., to Gala Industries, Inc. Underwater pelletizer and heat exchanger die plate. 4,123,207, Cl. 425-67.000.

Duffield, Robert: *See*—
Clarkson, Michael J.; and Duffield, Robert, 4,122,684, Cl. 62-54.000.

Dunbar, Frank C.: *See*—
Arnold, Jerry L.; Dunbar, Frank C.; Gibson, Alan F.; and Pierson, Marvin B., 4,123,291, Cl. 148-6.350.

Duncker, Jim: *See*—
Kinanen, Ilmari; and Duncker, Jim, 4,123,702, Cl. 324-58.50A.

Dunlop Limited: *See*—
Askam, John F., 4,122,883, Cl. 157-1.170.

Dunning, Reginald: *See*—
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,123,416, Cl. 260-42.180.

Du Pont de Nemours, E. I., and Company: *See*—
Berghmans, Jacques M. L.; and Vary, Eva M., 4,123,401, Cl. 260-29.60F.
Goddard, Steven J., 4,123,252, Cl. 71-92.000.
Haire, Michael J., 4,123,546, Cl. 424-274.000.

Klaver, Petrus; and Steenhof de Jong, Jacob G., 4,123,208, Cl. 425-72.00S.
Malhotra, Satish C., 4,123,606, Cl. 528-499.000.
Quinn, John A., 4,123,272, Cl. 96-35.100.
Stewart, Clare A., Jr., 4,123,603, Cl. 526-254.000.
DuRocher, Gideon A., to Essex Group, Inc. Thermal relay and automobile cornering lamp control utilizing the same. 4,123,746, Cl. 340-81.00R.
Dusbiber, Warren M., to Acushnet Company. Ball and process and composition of matter for production thereof. 4,123,061, Cl. 273-220.000.
Dussault, Edmund J.; Kochis, August J.; and Cross, Arthur A., to Eckel Industries, Inc. Flexible curtain. 4,122,887, Cl. 160-354.000.
Dutt, William H.; and Romanski, Eric R., to Albany International Corp. Seam for forming wires and dryer felts. 4,123,022, Cl. 245-10.000.
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., to Imperial Chemical Industries Limited. Analgesic and sedative polypeptides. 4,123,523, Cl. 424-177.000.
Duvall, David S.; and Paulonis, Daniel F., to United Technologies Corporation. Method of making a composite interlayer for diffusion bonding. 4,122,992, Cl. 228-176.000.
Dwyer, Gregory J., to Ex-Cell-O Corporation. Carton jam detection means. 4,122,760, Cl. 93-36.00R.
Dyckerhoff & Widmann Aktiengesellschaft: *See*—
Tang, Man-Chung, 4,123,485, Cl. 264-33.000.
Dynamics Research Corporation: *See*—
Leney, David E.; Stuart, Robert W.; and Anderegg, John S., 4,123,750, Cl. 340-347.00P.
E. R. Squibb & Sons, Inc.: *See*—
O'Connor, Jeremiah J.; Pilote, Raymond R.; and Linkenheimer, Wayne H., 4,123,522, Cl. 424-116.000.
Vogt, B. Richard, 4,123,532, Cl. 424-251.000.
Eadie, David W.; and Hancock, Charles J., to Quest Automation Limited. Photodrafting equipment. 4,123,763, Cl. 354-4.000.
Eastern Company, The: *See*—
Vass, George S.; and Speidel, Gerald M., 4,122,681, Cl. 405-261.000.
Eastman Kodak Company: *See*—
Ciurca, Samuel, Jr.; and Kohrt, Carl F., 4,123,273, Cl. 96-66.00T.
Dannelly, Clarence C., 4,123,206, Cl. 425-5.000.
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., 4,123,274, Cl. 96-66.00T.
Eastman Technology, Inc.: *See*—
Moeller, Charles R.; and Jeffers, Frederick J., 4,123,790, Cl. 360-111.000.
Eaton, John L., Jr., to SCM Corporation. Termination for an electrical resistance element. 4,123,743, Cl. 338-322.000.
Ebauches Electroniques S.A.: *See*—
Stampfli, Jean-Marcel, 4,122,664, Cl. 58-88.00B.
Eberspacher, J.: *See*—
Leins, Alfred, 4,122,673, Cl. 60-274.000.
Eckel Industries, Inc.: *See*—
Dussault, Edmund J.; Kochis, August J.; and Cross, Arthur A., 4,122,887, Cl. 160-354.000.
Edenvale Engineering Works (Proprietary) Limited: *See*—
Hill, Bruce S., 4,123,109, Cl. 299-18.000.
Edgar, John B.: *See*—
Queen, David S.; Bell, Peter W.; Dick, Thomas H.; and Edgar, John B., 4,123,313, Cl. 156-498.000.
Edwards, Garry: *See*—
Mandler, Walter; Edwards, Garry; and Wagner, Erich, 4,123,144, Cl. 350-222.000.
Eger, Donald M., to International Radio & Electronics, Inc. Adapter hub for a reel. 4,123,010, Cl. 242-68.300.
Egyt Gyogyszervegyeszeti Gyar: *See*—
Levai, Laszlo; and Mikite, Gyula, 4,123,615, Cl. 568-712.000.
Ehret, Gordon F.; and Rowley, William N., to Wylain, Inc. Test plug assembly and method for pressure testing the inlet connection for liquid jet floor outlet fittings. 4,122,592, Cl. 29-404.000.
Eisenwerk-Gesellschaft Maximilianshutte mbH: *See*—
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans G., 4,123,259, Cl. 75-60.000.
Eisman, Norman: *See*—
Price, Robert; and Eisman, Norman, 4,122,736, Cl. 83-23.000.
Eitzen, Vincent E.; and Moore, Robert R., to American Hospital Supply Corporation. Optical card reader apparatus. 4,122,998, Cl. 235-475.000.
Ekengren, Turid: *See*—
Bjorklund, James Axel C.; and Ekengren, Turid, 4,123,319, Cl. 162-158.000.
Ekinaka, Michael H.: *See*—
Mosior, Donald J.; Cawood, Charles D., Jr.; and Ekinaka, Michael H., 4,122,856, Cl. 128-311.000.
Electric Power Research Institute, Inc.: *See*—
Chatterji, Debajyoti; and Dubin, Robert R., 4,123,566, Cl. 427-115.000.
Electro-Nucleonics, Inc.: *See*—
Bullock, Frederick C.; Engelhardt, Alvin; Cirincione, Thomas J.; and Williams, Joseph A., 4,123,173, Cl. 356-246.000.
Electro-Technics, Inc.: *See*—
Zdrojkowski, Ronald J., 4,122,843, Cl. 128-2.06E.
Electroglas, Inc.: *See*—
Roch, Jacques L., 4,123,706, Cl. 324-158.00P.
Eli Lilly and Company: *See*—
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,123,612, Cl. 544-16.000.
Elkem-Spigerverket A/S: *See*—
Hyggen, Egil, 4,122,880, Cl. 152-216.000.
Hyggen, Egil, 4,122,881, Cl. 152-216.000.
Ellefson, Charles R.; and Hershenson, Fred M., to G. D. Searle & Co. 2-Aryl-4-(1-piperazinyl)-3H-1,5-benzodiazepines. 4,123,430, Cl. 260-243.300.
Elli, Carlo: *See*—
Bernardi, Luigi; Elli, Carlo; Falconi, Giovanni B.; and Ferrari, Rosella, 4,123,613, Cl. 544-408.000.
Ellinger, Earl H., to Dee, Inc. Beet harvester hitch. 4,123,081, Cl. 280-463.000.
Ellis, Jerry, to General Motors Corporation. Weatherstrip sealing arrangement. 4,123,100, Cl. 296-93.000.
Ellis, John S.: *See*—
Ellis, Larry C.; Ellis, John S.; and Cossin, Russell N., 4,122,923, Cl. 188-285.000.
Ellis, Larry C.; Ellis, John S.; and Cossin, Russell N., to Ace Controls, Inc. Adjustable hydraulic shock absorber. 4,122,923, Cl. 188-285.000.
Emerson, Robert T.: *See*—
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,123,569, Cl. 427-141.000.
Emery, William G., to Koppers Company, Inc. Reciprocating coke guide extension. 4,123,334, Cl. 202-262.000.
EMI Limited: *See*—
Oliver, Colin C., 4,123,659, Cl. 250-403.000.
Energy Conversion Devices, Inc.: *See*—
Klose, Peter H.; and Ovshinsky, Stanford R., 4,123,157, Cl. 355-43.000.
Energy Recovery Research Group, Inc.: *See*—
Rotter, Franz, 4,123,332, Cl. 201-15.000.
Engelhardt, Alvin: *See*—
Bullock, Frederick C.; Engelhardt, Alvin; Cirincione, Thomas J.; and Williams, Joseph A., 4,123,173, Cl. 356-246.000.
English Electric Valve Company Limited: *See*—
Jones, Eric; and Townsend, Rodney P., 4,123,225, Cl. 422-98.000.
Menown, Hugh; and Wheldon, Robert J., 4,123,684, Cl. 313-205.000.
Engman, Thomas; Ericsson, Dan; and Landen, Goran, to Husqvarna AB. Power saw chain. 4,122,741, Cl. 83-834.000.
Enso-Gutzeit Osakeyhtio: *See*—
Koskinen, Ensio, 4,123,363, Cl. 210-331.000.
Environmental Systems Corporation: *See*—
Carlson, Thomas B.; and Kreikebaum, Gerhard, 4,122,719, Cl. 73-342.000.
Epstein, Felix; and Epstein, Peter R. Means for effecting improvement in the manufacture of comminuted meat products. 4,123,557, Cl. 426-105.000.
Epstein, Peter R.: *See*—
Epstein, Felix; and Epstein, Peter R., 4,123,557, Cl. 426-105.000.
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Engman, Thomas; Ericsson, Dan; and Landen, Goran, 4,122,741, Cl. 83-834.000.
Eriksen, Leif H.: *See*—
Fritzvold, Bjorn H.; Carling, Helge; and Eriksen, Leif H., 4,123,317, Cl. 162-17.000.
Erikson, J. Alden; and Birkmeyer, William J., to PPG Industries, Inc. Amide modified saturated polyester polyols and method of making. 4,123,422, Cl. 528-273.000.
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Industrial Trading & Development Company B.V. Ball bearing assembly with plurality of ball guideways. 4,123,121, Cl. 308-6.00C.
Ernst Koch & Co.: *See*—
Herzog, Gunter, 4,122,698, Cl. 72-286.000.
Ernst Leitz Wetzlar GmbH: *See*—
Mandler, Walter; Edwards, Garry; and Wagner, Erich, 4,123,144, Cl. 350-222.000.
Escher Wyss GmbH: *See*—
Link, Christoph; and Trondle, Robert, 4,123,321, Cl. 162-272.000.
Escher Wyss Limited: *See*—
Miller, Helmut, 4,123,666, Cl. 290-52.000.
Essex Group, Inc.: *See*—
DuRocher, Gideon A., 4,123,746, Cl. 340-81.00R.
Stevens, Joe M.; and Porter, Elmer D., 4,123,633, Cl. 200-61.860.
ETA A.G. Ebauches-Fabrik: *See*—
Giger, Urs, 4,122,665, Cl. 58-121.00R.
Etablissement Dentaire Ivoclar: *See*—
Madlener, Bruno A., 4,123,046, Cl. 269-228.000.
Evans, David M., to S & C Electric Company. Support assembly for a circuit interrupting device. 4,123,639, Cl. 200-254.000.
Evans, James D.: *See*—
Brewer, David C.; Evans, James D.; Kohler, Dale M.; and Haselkorn, Michael H., 4,123,337, Cl. 204-129.300.
Ever-Wear, Inc.: *See*—
Brickman, Harold, 4,122,780, Cl. 108-25.000.
Evers, Alfred, to Hagenuk Vormals Neufeldt & Kuhnke GmbH. Arrangement for advancing rod stock pieces in turning machines. 4,122,735, Cl. 82-2.700.
Evrard, Paul; and Terroy, Michel-Claude, to Altulor. Method and apparatus for reinforcing a hot shaped shell. 4,123,494, Cl. 264-258.000.
Ex-Cell-O Corporation: *See*—
Dwyer, Gregory J., 4,122,760, Cl. 93-36.00R.

Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,122,755, Cl. 90-11.00A.
Exxon Production Research Company: *See—*
Williams, Robert E., 4,123,354, Cl. 210-40.000.
Exxon Research & Engineering Co.: *See—*
Baird, William C., Jr.; Bearden, Roby, Jr.; and Bollinger, Ralph L., Jr., 4,123,350, Cl. 208-108.000.
Brois, Stanley J.; and Gutierrez, Antonio, 4,123,373, Cl. 252-48.600.
Maa, Peter S., 4,123,347, Cl. 208-8.000.
F.A.T.A - Fabbrica Apparecchi Di Sollevamento E Trasporto Ed Affint S.p.A.: *See—*
Di Rosa, Getano, 4,122,778, Cl. 104-172.00S.
Fahey, Darryl R.; and Mahan, John E., to Phillips Petroleum Company. Trans-halo(acyl)bis(triethylphosphine)nickel(II) complexes and preparation thereof. 4,123,447, Cl. 260-439.00R.
Fair, Delbert W.; and Brown, Graydon L., to Continental Oil Company. Air cushion skirt. 4,122,909, Cl. 180-127.000.
Falconi, Giovanni B.: *See—*
Bernardi, Luigi; Elli, Carlo; Falconi, Giovanni B.; and Ferrari, Rosella, 4,123,613, Cl. 544-408.000.
Falla, Marjorie B. Pre-packaged patient identification kit. 4,122,947, Cl. 206-569.000.
Farnum, Henry M. Circumferential stereo spectacular with a mosaic in a scene. 4,123,152, Cl. 352-69.000.
Fassbinder, Hans G.: *See—*
Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans G., 4,123,259, Cl. 75-60.000.
Fathauer, George H., to Masco Corporation of Indiana. Program apparatus for radio receiver using frequency synthesizer. 4,123,715, Cl. 325-464.000.
Felix, Ernst, to Zellweger, Ltd. Apparatus for monitoring for thread breakage a continuous sequence of work positions on a textile machine. 4,122,657, Cl. 57-81.000.
Ferlise, Louis; and Mackey, Sherman E., to Huffy Corporation. Rotary-plunge tube notching system. 4,123,189, Cl. 408-21.000.
Fernandez, Allen: *See—*
Lewis, George R.; and Fernandez, Allen, 4,123,017, Cl. 244-3.160.
Fernandez, Avelino; Glass, Josef; Osegowitsch, Viktor; and Hehn, Wilfried, to Agfa-Gevaert AG. Washing chamber for photographic developing apparatus. 4,123,769, Cl. 354-322.000.
Ferrari, Rosella: *See—*
Bernardi, Luigi; Elli, Carlo; Falconi, Giovanni B.; and Ferrari, Rosella, 4,123,613, Cl. 544-408.000.
Ferro Corporation: *See—*
Ryan, John R.; and Shalita, Paul, 4,123,140, Cl. 350-105.000.
Ferrofluidics Corporation: *See—*
Moskowitz, Ronald; Stahl, Philip; and Reed, Walter R., 4,123,675, Cl. 310-49.00R.
Fessett, Kenneth: *See—*
Viero, Laurence; Cannon, John; Rademaker, George; Swanson, Williard; and Fessett, Kenneth, 4,123,089, Cl. 285-39.000.
Fiat Societa per Azioni: *See—*
Levizzari, Giannetto; and Ruspa, Giacomo, 4,122,723, Cl. 73-579.000.
Fiber Industries Inc.: *See—*
Gibbon, John D., 4,123,490, Cl. 264-147.000.
Ficht, Paulette G.: *See—*
Brouard, Claude M. H. E.; and Ficht, Paulette G., 4,123,429, Cl. 260-147.000.
Fiedler, Howard C.; and Cohen, Joseph T., to General Electric Company. Method of producing silicon-iron sheet materal, and product. 4,123,299, Cl. 148-111.000.
Fields, Everett H., to Ford Motor Company. Magnesium die-cast brake master cylinder. 4,122,596, Cl. 29-527.200.
Fikart, Josef L., to GTE Lenkurt Electric (Canada) Ltd. Slot transmission line coupling technique using a capacitor. 4,123,730, Cl. 333-26.000.
Finberg, Arne O., to Mobil Oil Corporation. Low density polyethylene toughened with ethylene/propylene copolymer. 4,123,417, Cl. 260-42.460.
Firestone Tire & Rubber Company, The: *See—*
Snyder, Dennis L.; Stayer, Mark L., Jr.; and Kang, Jung W., 4,123,503, Cl. 423-300.000.
Firmenich SA: *See—*
Skorianetz, Werner; Dastur, Khurshid P.; and Strickler, Hugo, 4,123,394, Cl. 252-522.000.
Fischer, Gertrude: *See—*
Heintze, York, 4,123,511, Cl. 424-46.000.
Fischer, Rainer: *See—*
Fischer, Stefan; Wollschlager, Dieter; Scharrenbroich, Helmut; and Fischer, Rainer, 4,123,217, Cl. 425-525.000.
Fischer, Stefan; Wollschlager, Dieter; Scharrenbroich, Helmut; and Fischer, Rainer, to Maschinenfabrik Johann Fischer. Apparatus for the manufacture of a thermoplastic container with a handle. 4,123,217, Cl. 425-525.000.
Fishbein, William; Olesch, Reinhard; and Rittenbach, Otto. Radar interference reduction. 4,123,755, Cl. 343-17.10R.
Fisher, Donald J., to Xerox Corporation. Combined corona generator and imaging surface cleaner. 4,123,154, Cl. 355-15.000.
Fisher, John M., to B.F. Goodrich Company, The. Shield bag. 4,123,662, Cl. 250-518.000.
Fisher, Peter M.; and Matsumiya, James A., to TSB International N.V. Wheel rim. 4,122,882, Cl. 152-381.2WC.
Fitzgerald, Dennis J.; and Breshears, Robert R., to United States of America, National Aeronautics and Space Administration. Plasma igniter for internal combustion engine. 4,122,816, Cl. 123-148.0DC.
Fitzherbert, Jeremy A.: *See—*
Botcherby, Stephen C. L.; Starbuck, Christopher P.; and Fitzherbert, Jeremy A., 4,123,166, Cl. 356-152.000.
Botcherby, Stephen C. L.; and Fitzherbert, Jeremy A., 4,123,167, Cl. 356-152.000.
Flagge, Bruce. Septic system liquid level control apparatus. 4,123,358, Cl. 210-104.000.
Flaherty, John J.: *See—*
Strauts, Eric J.; and Flaherty, John J., 4,123,797, Cl. 365-118.000.
Flair, Henry J., to Illinois Tool Works Inc. Machine for tracing the profile of an orbiting star gear. 4,122,609, Cl. 33-174.00P.
Fleming, David L.; Johansen, Thomas R.; and Torok, Ernest J., to Sperry Rand Corporation. Ambiguity plane optical processor incorporating magneto-optic, bubble domain histograph. 4,123,142, Cl. 350-162.0SF.
Fletcher, Graham J.: *See—*
Das, Tapan K.; Boyce, Peter H.; and Fletcher, Graham J., 4,123,724, Cl. 331-1.00A.
Fletcher, Wade: *See—*
Rowe, E. Riley; Fletcher, Wade; Markert, Herman R.; and Grady, Dwight D., 4,122,790, Cl. 113-120.00R.
Flett Development Company: *See—*
Kelley, Joseph A., 4,123,489, Cl. 264-141.000.
Flexsteel Industries, Inc.: *See—*
Quakenbush, Howard M., 4,123,028, Cl. 248-425.000.
Floyd, Middleton B., Jr.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,123,456, Cl. 562-503.000.
FMC Corporation: *See—*
Weber, Harry W., Jr., 4,123,450, Cl. 260-453.00P.
Fohl, Artur, to Repa Feinstanzwerk GmbH. Lock for motor vehicle safety belts. 4,122,584, Cl. 24-230.00A.
Foley, Edward M.; Dreyer, Dennis G.; and Rogers, Herbert E., Jr., to Cabot Corporation. Sintered high performance metal powder alloy. 4,123,266, Cl. 75-244.000.
Follert, Hans G.; Linde, Klaus; and Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Tunnel drive shield. 4,122,683, Cl. 405-142.000.
Ford, Bacon & Davis Texas, Inc.: *See—*
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,123,220, Cl. 431-353.000.
Ford, Eric H. Opto-electronic ignition systems for internal combustion engines. 4,122,814, Cl. 123-148.00E.
Ford, James R.: *See—*
Barton, James G.; and Ford, James R., 4,122,771, Cl. 101-123.000.
Ford Motor Company: *See—*
Fields, Everett H., 4,122,596, Cl. 29-527.200.
Grittner, Heinz; Giese, Ralph; and Korner, Paul, 4,122,583, Cl. 24-208.00A.
Hoadley, Frederick E., 4,123,186, Cl. 407-54.000.
Koss, George A., 4,123,113, Cl. 302-2.00R.
Pretty, John E., 4,122,578, Cl. 15-250.230.
Ford, Thomas E. Artist's kit. 4,123,127, Cl. 312-230.000.
Forlow, John K.: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,122,755, Cl. 90-11.00A.
Forsyth, Frank R.: *See—*
Poapst, Peter A.; and Forsyth, Frank R., 4,123,558, Cl. 426-268.000.
Foster Wheeler Energy Corporation: *See—*
Zipay, Albert J.; and Gorzegno, Walter P., 4,123,237, Cl. 55-205.000.
Fox, Donald P.: *See—*
Vild, Joseph P.; Cleary, William I.; and Fox, Donald P., 4,123,708, Cl. 324-224.000.
Foxboro Company, The: *See—*
Olsen, Everett O., 4,123,696, Cl. 318-623.000.
Francey, Melvin H.: *See—*
Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., 4,122,926, Cl. 192-18.00A.
Franer, Victor R., to Minnesota Mining and Manufacturing Company. Color source sheet with rubber binder. 4,123,580, Cl. 428-304.000.
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, to Siemens Aktiengesellschaft. Apparatus for the determination of respiratory passageway resistance. 4,122,839, Cl. 128-2.080.
Franke, Robert H., to Burroughs Corporation. Asynchronous digital circuit testing system. 4,122,995, Cl. 235-302.000.
Franklin Container Corporation: *See—*
Blatt, David H., 4,122,949, Cl. 206-303.000.
Frantz, Robert M.: *See—*
Dammel, Howard W.; Frantz, Robert M.; Luke, James H.; and Skrzypczyk, William G., 4,123,642, Cl. 219-10.590.
Franz, James H., Jr.: *See—*
Anderson, Larry W.; and Franz, James H., Jr., 4,123,693, Cl. 318-376.000.
Freeman, Quilla H. Stringed musical instrument pick. 4,122,746, Cl. 84-322.000.
Freeman, Willie B.: *See—*
Cromer, Charles F.; Yoon, Kue H.; and Freeman, Willie B., 4,123,636, Cl. 200-148.00A.
Freenor, Francis J., III; and Koerber, Barbara M., to Chevron Research Company. O-sulfonyl-alpha-cyano 2,6-dihalobenzaldoximes. 4,123,255, Cl. 71-103.000.
Freeport Minerals Company: *See—*
Bryant, Raymond G., Jr.; and Cockrell, Clifford M., 4,123,107, Cl. 299-6.000.
Frei, Roland; Gutmann, Franz; Sieber, Peter; and Koeppel, Peter, to

Plaston AG, Kunststoffwerke Hans Frei & Sohne. Filters for liquids. 4,123,228, Cl. 422-274.000.

French, Denis E. E., to Moore Business Forms, Inc. Continuous stationery assemblies. 4,123,086, Cl. 282-11.50A.

French, Park, to Sterndent Corporation. Comparison type colorimeter. 4,123,172, Cl. 356-188.000.

Frey, Fred J.; Hynek, Stanley; and Losinski, Edward, to InterRoyal Corporation. Chair construction. 4,123,105, Cl. 297-451.000.

Fritzvold, Bjorn H.; Carling, Helge; and Eriksen, Leif H., to Myrens Verksted A/S. Method and an apparatus for processing finely divided fibrous pulp with gas without overpressure. 4,123,317, Cl. 162-17.000.

Frost, Kenneth A., Jr., to Chevron Research Company. Pour point depressants. 4,123,232, Cl. 44-72.000.

Frungel, Frank. Arrangement for determining the density of natural fog in the atmosphere. 4,123,665, Cl. 250-565.000.

Fuji Photo Film Co., Ltd.: *See—*
Karino, Yukio; Sakaguchi, Shinji; and Yoshida, Takashi, 4,123,275, Cl. 96-77.000.
Kita, Nobuyuki; and Narutomi, Yasuhisa, 4,123,276, Cl. 96-91.00R.
Kobayashi, Odawara, 4,123,279, Cl. 96-91.00D.
Ochiai, Takeji, 4,123,277, Cl. 96-85.000.

Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, to Nippon Steel Corporation; and Mishima Kosan Co., Ltd. Magnetic field sensor housed in a cooling device for sensing the charge in a shaft furnace or the like. 4,123,707, Cl. 324-208.000.

Fujinami, Akira: *See—*
Kameda, Nobuyuki; Hisada, Yoshio; Takayama, Chiyozo; Kato, Toshiro; and Fujinami, Akira, 4,123,549, Cl. 424-274.000.

Fujita, Masao: *See—*
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,123,525, Cl. 424-200.000.

Fujita, Tatsu: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.

Fujitsu Fanuc Limited: *See—*
Shichida, Hiromichi; Gamo, Gotaro; Nomura, Yoshiyuki; Hattori, Kiyoshi; and Koiwai, Yutaka, 4,123,645, Cl. 219-69.00W.

Fujiwara, Kunio: *See—*
Nakahara, Tsuneo; Hoshikawa, Masao; Shiraishi, Satoshi; Kurosaki, Shiro; and Fujiwara, Kunio, 4,123,483, Cl. 264-1.000.

Fukuda, Kiyou; Kawabata, Toshihiko; and Asai, Kiyotsugu, to Mitsui-Nisso Corporation. Urethane-base sealing material. 4,123,412, Cl. 260-30.8DS.

Fukuda, Mitsuhisa, to Ricoh Company, Ltd. Optical reader. 4,122,997, Cl. 235-455.000.

Fukui, Yoshiharu: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,123,387, Cl. 252-429.00B.

Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, to Nisshin Steel Company Ltd.; and Japan Metals & Chemicals, Co., Ltd. Method of treating a plating sludge. 4,123,257, Cl. 75-40.000.

Fukushima, Mitsuru: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.

Fukushima, Tadahide: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.

Furuya, Tutomu: *See—*
Inowa, Shigeru; Nakamura, Issei; and Furuya, Tutomu, 4,123,156, Cl. 355-3.0SC.

Furyk, Robert C.; and Gow, Jon E. P., to Creative Inventions. Game: Disk-golf. 4,123,058, Cl. 273-87.00H.

Fushida, Akira; Morikawa, Hiroichi; Shinsho, Toshihiro; Miyazaki, Takaaki; and Aizawa, Tatsuo, to Mita Industrial Company, Limited. Alkali metal dichromate as memory resistance improver for zinc oxide photoconductors in electrostatic photography. 4,123,271, Cl. 96-1.800.

Futamura, Jun: *See—*
Kobayashi, Tamotsu; and Futamura, Jun, 4,122,714, Cl. 73-194.0EM.

G. D. Searle & Co.: *See—*
Ellefson, Charles R.; and Hershenson, Fred M., 4,123,430, Cl. 260-243.300.

Gabrielson, Alan L.; and Magazian, Harry, to Torrington Company, The. Bearing element. 4,123,122, Cl. 308-238.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,123,512, Cl. 424-54.000.

Gagnier, Real; Bourne, John B.; and Terry, John B., to Northern Telecom Limited. Switching network for a PCM TDM system. 4,123,624, Cl. 179-15.0AT.

Gala Industries, Inc.: *See—*
Dudley, Vernon E., 4,123,207, Cl. 425-67.000.

Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, to Andco Industries, Inc. Method and apparatus for electrochemical contaminant removal from liquid media. 4,123,339, Cl. 204-149.000.

Gallizia, Achille; and Bandel, Paolo, to Industrie Pirelli S.p.A. Process for the injection molding of pneumatic tires having symmetrical parts of similar physical characteristics. 4,123,496, Cl. 264-329.000.

Gamble, Bruce B.: *See—*
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., 4,123,677, Cl. 310-52.000.

Gambro AB: *See—*
Hakansson, Bo H.; Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,123,353, Cl. 210-22.00C.

Gamo, Gotaro: *See—*
Shichida, Hiromichi; Gamo, Gotaro; Nomura, Yoshiyuki; Hattori, Kiyoshi; and Koiwai, Yutaka, 4,123,645, Cl. 219-69.00W.

Gardner, Charles R. Valve assembly and spraying apparatus therefor. 4,123,007, Cl. 239-414.000.

Gardner-Denver Company: *See—*
Bendure, Harry; and Traxson, Larry L., 4,122,731, Cl. 74-674.000.
Deremo, Edwin J.; and Olving, Hans P., 4,123,188, Cl. 408-17.000.
Kathmann, Stephen J.; Post, Roger L.; Herschler, Michael G.; and Anerino, Sylvester L., 4,123,203, Cl. 417-252.000.

Garsky, Victor M., to American Home Products Corporation. (2-MeAla^5)-somatostatin and analogues thereof. 4,123,425, Cl. 260-112.50S.

Gates, Bruce C.; Magnotta, Vincent L.; and Schuit, George C. A., to University of Delaware. Production of very strongly acidic solids for hydrocarbon conversions. 4,123,379, Cl. 252-184.000.

Gates Rubber Company, The: *See—*
Hammel, Ronald O., 4,123,598, Cl. 429-159.000.

Gates, William E.: *See—*
Pieters, Wim J. M.; Carlson, Emery J.; Gates, William E.; and Conner, William C., Jr., 4,123,389, Cl. 252-441.000.

Gaudette, Norman O. Jelly tube construction and method of waterproofing cable. 4,123,304, Cl. 156-48.000.

Gay, Gerald A. Skywriting apparatus. 4,122,618, Cl. 40-213.000.

Gay, Michel, to Rhone-Poulenc Industries. Plasticized, heat-stabilized PVC compositions. 4,123,399, Cl. 260-23.0XA.

Gay, Michel, to Rhone-Poulenc Industries. Heat-stabilized PVC compositions. 4,123,400, Cl. 260-23.0XA.

Geithman, Glenn A.; and Woodmansee, Wayne E., to Boeing Company, The. Swept frequency audible bond tester. 4,122,724, Cl. 73-588.000.

General Dynamics: *See—*
Barton, James G.; and Ford, James R., 4,122,771, Cl. 101-123.000.

General Electric: *See—*
Katchman, Arthur, 4,123,474, Cl. 260-874.000.

General Electric Company: *See—*
Abolins, Visvaldis; and Katchman, Arthur, 4,123,475, Cl. 260-874.000.
Betts, Joseph E.; and Holub, Fred F., 4,123,586, Cl. 428-391.000.
Chang, David R., 4,123,594, Cl. 428-651.000.
Chang, David R., 4,123,595, Cl. 428-667.000.
Dammel, Howard W.; Frantz, Robert M.; Luke, James H.; and Skrzypczyk, William G., 4,123,642, Cl. 219-10.590.
Fiedler, Howard C.; and Cohen, Joseph T., 4,123,299, Cl. 148-111.000.
Holub, Fred F.; Scott, Steven W.; and Wilson, Phillip S., 4,123,436, Cl. 260-30.80R.
LaConti, Anthony B.; Torkildsen, Robert A.; and Jones, Robert C., 4,123,700, Cl. 324-29.000.
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., 4,123,677, Cl. 310-52.000.
Lee, Gim F., Jr., 4,123,410, Cl. 260-30.60R.
Mark, Victor; and Wilson, Phillip S., 4,123,413, Cl. 260-32.6NR.
Molari, Richard E., Jr., 4,123,588, Cl. 428-412.000.
Osteen, Mitchell M., 4,123,690, Cl. 315-258.000.
Prince, David C., Jr.; and Koch, Carl C., 4,123,196, Cl. 415-181.000.
Rosenbaum, Herman S.; Packard, Douglas R.; and Levin, Harry A., 4,123,498, Cl. 423-2.000.
Smith, William E., 4,123,444, Cl. 260-347.800.
Wambach, Allen D., 4,123,415, Cl. 260-40.00R.

General Foods Corporation: *See—*
Grieve, Harold R.; and Andersen, Thomas S., 4,122,948, Cl. 206-622.000.

General Mills Chemicals, Inc.: *See—*
Jones, Duane A., 4,123,397, Cl. 260-17.4GC.

General Motors Corporation: *See—*
Atkins, Larry P.; and Bish, James R., 4,122,890, Cl. 164-444.000.
Ballantyne, David B., 4,123,640, Cl. 200-296.000.
Bennett, George T.; and Brucken, Byron L., 4,122,930, Cl. 192-84.00C.
Biskup, Edward J., 4,123,079, Cl. 280-220.000.
Bowler, Lauren L.; and Rice, John O., 4,122,811, Cl. 123-119.0EC.
Buetemeister, Earl H., 4,123,729, Cl. 331-181.000.
Chana, Howard E., 4,122,732, Cl. 74-863.000.
Chou, Cheng-Chien; and Rosebrock, Theodore L., 4,122,668, Cl. 60-39.16R.
Ellis, Jerry, 4,123,100, Cl. 296-93.000.
Hanink, Dean K., 4,123,294, Cl. 148-13.100.
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,123,297, Cl. 148-103.000.
Kingsbury, William L.; Thurston, Kelly W.; and Chapman, Harry L., 4,122,804, Cl. 123-32.0ST.
Kingsbury, William L.; and Thurston, Kelly W., 4,122,805, Cl. 123-32.0ST.
Nelson, Robert H., 4,123,023, Cl. 246-182.00B.
Pearce, Warren, Jr.; and Russo, Andrew, Jr., 4,123,131, Cl. 339-117.00R.
Reider, Samuel B., 4,122,670, Cl. 60-39.650.
Rober, Herbert E., 4,122,705, Cl. 73-794.000.
Schluckebier, Floyd A., 4,122,866, Cl. 137-625.270.

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Vogelsberg, William A., 4,122,808, Cl. 123-117.00A.
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Salzman, Ronald N.; and Herbst, Norman R., 4,123,178, Cl. 366-338.000.
General Time Corporation: *See—*
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Gephart, Don A.; and Weber, Bruce H. Circuit for monitoring the mechanical power from an induction motor and for detecting excessive heat exchanger icing. 4,123,792, Cl. 361-30.000.
Germain, Lee A., to Goodyear Tire & Rubber Company, The. Vapor recovery filler neck assembly. 4,122,968, Cl. 220-86.00R.
Gerry, Martin E. Non-DC ignition system with variable ignition timing. 4,122,815, Cl. 123-148.00E.
Gerry, Martin E. Transient intermodulation ignition system. 4,123,689, Cl. 315-209.00R.
Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH: *See—*
Maixner, Uwe; and Milferstadt, Dieter, 4,123,655, Cl. 250-305.000.
Gesellschaft fur Schwerionenforschung mbH: *See—*
Keller, Roderich; and Muller, Michael, 4,123,686, Cl. 313-230.000.
Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule: *See—*
Graf, Jean-Pierre; and Celio, Tino, 4,123,778, Cl. 358-107.000.
Getman, Anatoly F.: *See—*
Shulzhenko, Alexandr A.; and Getman, Anatoly F., 4,123,504, Cl. 423-446.000.
Getson, J. Charles; and Adams, Patrick J., to SWS Silicones Corporation. Oil resistant modified silicone composition. 4,123,472, Cl. 260-827.000.
Geurts, Leonardus H.; and Meijer, Peter J. N., to Stamicarbon, B.V. Process for preparing 2-pyrrolidones. 4,123,438, Cl. 260-326.5FN.
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Follert, Hans G.; Linde, Klaus; and Jutte, Hans, 4,122,683, Cl. 405-142.000.
Gibbon, John D., to Fiber Industries Inc. Production of a high tenacity, low denier poly(ethylene terephthalate) fibrillated tape yarn. 4,123,490, Cl. 264-147.000.
Gibson, Alan F.; and Pierson, Marvin B., to Armco Steel Corporation. Method of treating steel strip and sheet surfaces for metallic coating. 4,123,292, Cl. 148-6.350.
Gibson, Alan F.: *See—*
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Allen, Ralph E.; and Gibson, Christian D., 4,122,957, Cl. 214-16.40A.
Gibson, Jack E. Apparatus for coating the interior of tubular goods. 4,122,798, Cl. 118-50.000.
Gidley, John A. F., to Imperial Metal Industries (Kynoch) Limited. Cutting sheet material having tacky layer thereon. 4,123,572, Cl. 427-272.000.
Giese, Ralph: *See—*
Grittner, Heinz; Giese, Ralph; and Korner, Paul, 4,122,583, Cl. 24-208.00A.
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, to Ruhrchemie Aktiengesellschaft. Separation of carbon black by the use of an oxygen containing higher boiling product. 4,123,235, Cl. 55-85.000.
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Addicks, Lyle F.; Gift, Bennie; and DiCicco, William R., Jr., 4,122,564, Cl. 4-326.000.
Giger, Urs, to ETA A.G. Ebauches-Fabrik. Method of manufacturing a pallet lever and pallet lever made by this method. 4,122,665, Cl. 58-121.00R.
Giles, Alan F.; and Hendriks, Albertus G., to Internationale Octrooi Maatschappij "OCTROPA" B.V. Machine for the preparation of packs of articles of a pre-determined weight. 4,122,941, Cl. 198-774.000.
Gilg, Bernard; Muller, Helmut; and Rody, Jean, to Ciba-Geigy Corporation. Stabilizer system for stabilizing styrene polymers. 4,123,418, Cl. 260-45.8NT.
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Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, 4,123,694, Cl. 318-443.000.
Gillespie, Peter J., to Bridon Engineering Limited. Valves. 4,123,037, Cl. 251-367.000.
Gillette Company, The: *See—*
Guimond, Ronald N.; and Thompson, Harold R., 4,122,978, Cl. 222-189.000.
Perry, Roger L., 4,122,600, Cl. 30-90.000.
Sastri, Suri A.; and Hahn, Steve S., 4,122,602, Cl. 30-346.500.
Sastri, Suri A., 4,122,603, Cl. 30-346.500.
Gilliams, Yvan K.; De Volder, Noel J.; De Winter, Walter F.; and Tavernier, Bernard H., to Agfa-Gevaert N.V. Electrophoretic development. 4,123,374, Cl. 252-62.10L.
Gillotti, Michael A. Book holder. 4,123,029, Cl. 248-453.000.
Gilmore, Thomas P.; and Stich, Frederick A., to Allis-Chalmers Corporation. Adjustable speed electric motor drive having constant harmonic content. 4,123,692, Cl. 318-227.000.
Girling Limited: *See—*
Harvey, Geoffrey, 4,122,920, Cl. 188-73.400.
Giuffredi, Giancarlo, to Coster Tecnologie Speciali S.p.A. Aerosol metering valve provided with pumping effect. 4,122,982, Cl. 222-321.000.
Givner, Morris L.; and Schilling, Guenther, to American Home Products Corporation. Diagnostic test device. 4,123,224, Cl. 422-59.000.
Givner, Morris L.: *See—*
Banik, Upendra K.; and Givner, Morris L., 4,123,509, Cl. 424-12.000.
Banik, Upendra K.; and Givner, Morris L., 4,123,510, Cl. 424-12.000.
Gladstone, David J.; and Moldram, Peter A., to Post Office, The. Electronic display apparatus including a DC-responsive electroluminescent phosphor screen. 4,123,751, Cl. 340-324.00M.
Glas, Willi, to Robert Bosch GmbH. Pressure-equalizing valve for a packaging container. 4,122,993, Cl. 229-62.500.
Glass, Josef: *See—*
Fernandez, Avelino; Glass, Josef; Osegowitsch, Viktor; and Hehn, Wilfried, 4,123,769, Cl. 354-322.000.
Glauser, Fritz: *See—*
Walz, Theo; and Glauser, Fritz, 4,122,938, Cl. 198-411.000.
Glenn, William H.: *See—*
Chenausky, Peter P.; and Glenn, William H., 4,123,149, Cl. 350-294.000.
Glitsch, Inc.: *See—*
McClain, Robert Woodrow, 4,123,008, Cl. 239-568.000.
Glory Kogyo Kabushiki Kaisha: *See—*
Inoue, Komei; and Kosaka, Tosihisa, 4,122,935, Cl. 194-32.000.
Glyco-Metall-Werke Daelen & Loos GmbH: *See—*
Lehnhart, Dieter, 4,122,701, Cl. 72-354.000.
Gnieser, Jurgen; and Pelloni, Luciano, to Sulzer Brothers Limited. Apparatus and process for treating contaminated water. 4,123,341, Cl. 204-152.000.
Goddard, Steven J., to Du Pont de Nemours, E. I., and Company. Methoxy substituted cycloalkanopyrazole herbicides. 4,123,252, Cl. 71-92.000.
Godwin, Fred D. Apparatus for placing masonry modules. 4,122,648, Cl. 52-749.000.
Goertler, Horst: *See—*
Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, 4,123,694, Cl. 318-443.000.
Goffe, William L., to Xerox Corporation. Setting electrical latent images in migration imaging elements. 4,123,283, Cl. 96-1.0PS.
Goldschmidt, Arthur M., to RCA Corporation. Turntable rotational speed and phase control system for a video disc play/record apparatus. 4,123,779, Cl. 358-128.000.
Golovko, Zoya I.: *See—*
Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I., 4,123,735, Cl. 336-30.000.
Gonser, Donald I., to Dentsply Research and Development Corporation. Control circuit for an electrical device. 4,123,673, Cl. 307-326.000.
Goodwin, Wayne M., Sr. Trailer. 4,122,962, Cl. 214-394.000.
Goodyear Aerospace Corporation: *See—*
Musyt, William, 4,123,582, Cl. 428-335.000.
Goodyear Tire & Rubber Company, The: *See—*
Germain, Lee A., 4,122,968, Cl. 220-86.00R.
Gordon, Stanley I., to American Optical Corporation. Hydrophilic contact lens. 4,123,407, Cl. 260-29.6TA.
Gordon, Stanley I., to American Optical Corporation. Hydrogel contact lens. 4,123,408, Cl. 260-29.6TA.
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, to Eli Lilly and Company. 7-(5-Amino-5-carboxyvaleramido)-3-(carbamoyloloxymethyl)-3-cephem-4-carboxylic acid. 4,123,612, Cl. 544-16.000.
Gormley, James J.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., 4,123,523, Cl. 424-177.000.
Gorodissky, Leonid G.; Romanov, Nikolai T., deceased; and by Romanova, Anantasia I., administratrix. Chamber for treating band-type material under overpressure. 4,122,691, Cl. 68-5.00E.
Gorzegno, Walter P.: *See—*
Zipay, Albert J.; and Gorzegno, Walter P., 4,123,237, Cl. 55-205.000.
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Hegeman, Karl-Rudolf, 4,123,238, Cl. 55-226.000.
Gotzelmann KG Industrieabwasser-Anlagen: *See—*
Kammel, Roland; and Lieber, Hans-Wilhelm, 4,123,340, Cl. 204-149.000.
Gow, Jon E. P.: *See—*
Furyk, Robert C.; and Gow, Jon E. P., 4,123,058, Cl. 273-87.00H.
Gozhansky, Baruch: *See—*
Yachin, Ami; and Gozhansky, Baruch, 4,123,143, Cl. 350-171.000.
Grady, Dwight D.: *See—*
Rowe, E. Riley; Fletcher, Wade; Markert, Herman R.; and Grady, Dwight D., 4,122,790, Cl. 113-120.00R.
Graf, Jean-Pierre; and Celio, Tino, to Gesellschaft zur Forderung der Forschung an der Eidgenossischen Technischen Hochschule. Method of and apparatus for determining the sharpness of a picture. 4,123,778, Cl. 358-107.000.
Gragoe, Edward J., Jr.: *See—*
Smith, Robert L.; Stokker, Gerald E.; and Gragoe, Edward J., Jr., 4,123,537, Cl. 424-263.000.

Graham, James: *See*—
Keem, Phillip W.; Kaimins, Laimons; and Graham, James, 4,123,197, Cl. 415-123.000.
Graham, Patricia A.: *See*—
Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., 4,123,274, Cl. 96-66.00T.
Granger, Maurice. Apparatus for the cutting and simultaneous dispensing of a web of roll material. 4,122,738, Cl. 83-314.000.
Grant, Herbert L., to S.S. Steiner, Inc. Method for processing hops for brewing. 4,123,561, Cl. 426-600.000.
Granzow, Wayne G., to Armco Steel Corporation. Process for forming sheet metal stock. 4,122,700, Cl. 72-342.000.
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., to Standard Oil Company, The. Process for the manufacture of acrylonitrile and methacrylonitrile. 4,123,453, Cl. 260-465.300.
Gravert, William H., to Marine Moisture Control Company, Inc. Ullage measuring device. 4,123,753, Cl. 340-621.000.
Gray, Frederic W., to Colgate-Palmolive Company. Peroxymonosulfate-base bleaching and bleaching detergent compositions. 4,123,376, Cl. 252-99.000.
Grebe, Karl: *See*—
Diggs, Edward J.; and Grebe, Karl, 4,122,921, Cl. 188-79.5GE.
Gresch, Heinz: *See*—
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,123,502, Cl. 423-230.000.
Gretler, Heinrich, to Bauer Kaba AG Sicherheits-Schliessyteme. Key for a cylinder lock. 4,122,694, Cl. 70-406.000.
Grieve, Harold R.; and Andersen, Thomas S., to General Foods Corporation. Carton incorporating easily openable and reclosable pouring aperture. 4,122,948, Cl. 206-622.000.
Grimm, Robert; and Koschmieder, Hartmut, to Industriewerk Schaeffler OHG. Method of producing axial roller bearing cages. 4,122,589, Cl. 29-148.40C.
Grinstead, Robert R.; Jones, Kenneth C.; and Nasutavicus, Wilmonte A., to Dow Chemical Company, The. Nitro-substituted benzoxazoles having utility as metallurgical extractants. 4,123,435, Cl. 260-307.00D.
Grittner, Heinz; Giese, Ralph; and Korner, Paul, to Ford Motor Company. Fastening clips for trim panels particularly for motor vehicles. 4,122,583, Cl. 24-208.00A.
Groetschel, Karl M. Methods of and apparatus for applying roof mats to mine workings. 4,122,682, Cl. 405-150.000.
Grosse, Ludwig: *See*—
Dorr, Hans W.; and Grosse, Ludwig, 4,123,593, Cl. 428-535.000.
Grossner, Dolores E. Carrier and skin-protecting cover for urine bags. 4,122,851, Cl. 128-295.000.
Gruber, Wolfgang: *See*—
Hundt, Dieter; Gruber, Wolfgang; Klarwein, Michael; and Roeschlau, Peter, 4,123,384, Cl. 252-408.000.
Grundmann, Edgard, to Volkswagenwerk Aktiengesellschaft. Vapor engine. 4,122,756, Cl. 91-180.000.
GTE Lenkurt Electric (Canada) Ltd.: *See*—
Fikart, Josef L., 4,123,730, Cl. 333-26.000.
Guibas, Mark. Air gun game with different sized target pipes. 4,123,059, Cl. 273-101.000.
Guidotti, Vincenzo: *See*—
Credali, Lino; and Guidotti, Vincenzo, 4,123,424, Cl. 528-337.000.
Guimond, Ronald N.; and Thompson, Harold R., to Gillette Company, The. Pressurized package for dispensing a product in a finely dispersed spray pattern with little dilution by propellant. 4,122,978, Cl. 222-189.000.
Gulf Oil Corporation: *See*—
Kellum, Gene E.; and Thompson, Jack W., 4,123,601, Cl. 526-79.000.
Gulf & Western Manufacturing Company: *See*—
Lindahl, Herbert S.; and Datta, Chander, 4,122,686, Cl. 62-81.000.
Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., 4,122,926, Cl. 192-18.00A.
Gunzenhauser, Sigmund: *See*—
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,123,439, Cl. 260-326.50B.
Gurgone, Joseph F. Vehicle theft prevention system. 4,123,745, Cl. 340-63.000.
Gusching, Nagle V.; and Prescott, Ralph E., to Monarch Machine Tool Company, The. Tool utilization mechanism. 4,122,597, Cl. 29-568.000.
Gustafson, Reuben V. Liquid level sensor. 4,122,718, Cl. 73-304.00C.
Guthrie, David B.; and Leiendecker, Donald M., to Petrolite Corporation. Clear, bright oil-soluble aluminum-containing compositions. 4,123,231, Cl. 44-51.000.
Gutierrez, Antonio: *See*—
Brois, Stanley J.; and Gutierrez, Antonio, 4,123,373, Cl. 252-48.600.
Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Preparation of cis and trans aconitic acids and their salts. 4,123,458, Cl. 562-595.000.
Gutierrez, Eddie N.; and Lamberti, Vincent, to Lever Brothers Company. Preparation of aconitic acid. 4,123,459, Cl. 562-595.000.
Gutmann, Franz: *See*—
Frei, Roland; Gutmann, Franz; Sieber, Peter; and Koeppel, Peter, 4,123,228, Cl. 422-274.000.
H. J. Langen & Sons Ltd.: *See*—
Langen, Marinus J. M., 4,122,939, Cl. 198-482.000.
Hack, Helmut; Schmidt, Robert R.; and Dickore, Karlfried, to Bayer Aktiengesellschaft. Herbicidal compositions. 4,123,253, Cl. 71-93.000.
Haerr, Raymond H., to Xomed Inc. Pad for anchoring an article to the skin of a patient. 4,122,857, Cl. 128-348.000.
Hafner, Joseph A. Construction panel. 4,122,643, Cl. 52-520.000.
Hagen, Alf R.; and Hagen, Eric C. Floating breakwater and energy collecting system. 4,123,185, Cl. 405-76.000.
Hagen, Eric C.: *See*—
Hagen, Alf R.; and Hagen, Eric C., 4,123,185, Cl. 405-76.000.
Hagenuk Vormals Neufeldt & Kuhnke GmbH: *See*—
Evers, Alfred, 4,122,735, Cl. 82-2.700.
Hagopian, Arpi; Carlo, Dennis J.; and Stoudt, Thomas H., to Merck & Co., Inc. Method for preparing high molecular weight meningococcal Group C vaccine. 4,123,520, Cl. 424-92.000.
Hahn, Steve S.: *See*—
Sastri, Suri A.; and Hahn, Steve S., 4,122,602, Cl. 30-346.500.
Haire, Michael J., to Du Pont de Nemours, E. I., and Company. Antidepressant compounds. 4,123,546, Cl. 424-274.000.
Hakansson, Bo H.; Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., to Gambro AB. Method and apparatus for measuring the content of a low-molecular weight compound in a complex medium. 4,123,353, Cl. 210-22.00C.
Hale, Jacques A. G.; and Turner-Smith, Alan Robert, to U.S. Philips Corporation. Pattern recognition system. 4,123,695, Cl. 318-561.000.
Hall, John B.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
Hall, Mitchell A., to Monarch Tool & Manufacturing Company. Lock head protector. 4,122,695, Cl. 70-417.000.
Hall, William C.; and Peterson, John M., to Chemtree Corporation. Non-combustible nuclear radiation shields with high hydrogen content. 4,123,392, Cl. 252-478.000.
Halliburton Company: *See*—
Loesch, Stanley B., 4,122,717, Cl. 73-231.00R.
Hallock, Robert L. Flat fastener for driving into metallic material. 4,122,752, Cl. 85-30.000.
Halm, James M. Boron chelates as acceptor type sensitizers for photoconductive polymers. 4,123,268, Cl. 96-1.0PC.
Halpern, Neil S. Camera and film identification system. 4,123,767, Cl. 354-107.000.
Hammann, Ingeborg: *See*—
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,123,449, Cl. 260-453.0AR.
Hammel, Ronald O., to Gates Rubber Company, The. Battery pack and container. 4,123,598, Cl. 429-159.000.
Hammes, Paul A.: *See*—
Morse, Lewis D.; Walker, William G.; and Hammes, Paul A., 4,123,382, Cl. 252-316.000.
Hancock, Charles J.: *See*—
Eadie, David W.; and Hancock, Charles J., 4,123,763, Cl. 354-4.000.
Handy, Richard L.: *See*—
Lutenegger, Alan J.; Handy, Richard L.; and Hoover, James M., 4,122,704, Cl. 73-822.000.
Hanink, Dean K., to General Motors Corporation. Method of separating ferritic steel or ductile iron from certain nonferrous metals. 4,123,294, Cl. 148-13.100.
Hanka, Ladislav J.; and Wiley, Paul F., to Upjohn Company, The. Antibiotic U-53,946 and process for preparing the same. 4,123,521, Cl. 424-121.000.
Hannan, Michael D.: *See*—
Clements, Luther D.; Hannan, Michael D.; Hinds, Robert J.; and Vose, Richard W., 4,123,357, Cl. 210-71.000.
Hansen, Clarence M.: *See*—
Ledebuhr, Richard L.; Hansen, Clarence M.; and Patterson, Richard J., 4,122,766, Cl. 99-640.000.
Hansen, Harold V.: *See*—
Harbert, Jimmy D.; and Hansen, Harold V., 4,122,974, Cl. 221-13.000.
Hanson, Paul B. Articulated bed. 4,122,567, Cl. 5-345.00R.
Hansted Corporation: *See*—
Stehlin, Theodore A., 4,123,095, Cl. 285-409.000.
Hanyo, Susumu; Yamaguchi, Jousuke; Morishita, Yoshiyuki; and Noguchi, Itoshi, to Daiichi Koshuha Kogya Kabushiki Kaisha. Means and method for reducing radius expansion in the bending of elongated materials. 4,122,697, Cl. 72-128.000.
Hapgood, William H., to Raytheon Company. Solar heating system. 4,122,830, Cl. 126-271.000.
Harada, Fumio: *See*—
Mochizuki, Taketoshi; Harada, Fumio; Imaizumi, Tadahiro; and Nose, Koichi, 4,122,688, Cl. 62-196.00R.
Harbert, Jimmy D.; and Hansen, Harold V., to Deere & Company. Variable speed planter seed drive. 4,122,974, Cl. 221-13.000.
Harbord, Horace R. Propeller. 4,123,198, Cl. 416-243.000.
Hardman, Harley F.: *See*—
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,123,453, Cl. 260-465.300.
Hardy, Paul R.; and Spencer, Arthur T., to PYE (Electronic Products Ltd.). Screw or nut and a captive washer. 4,123,132, Cl. 339-246.000.
Hargrove, Maxie G., to B & H Automotive. Tool holder apparatus for a workstand. 4,122,956, Cl. 211-131.000.
Harrington Manufacturing Company: *See*—
Danford, Tiras J., 4,123,221, Cl. 432-152.000.
Harris, Frank N. Incinerator. 4,122,557, Cl. 4-111.300.
Hartmann, Ernst G.; Krech, Hans; and Meir, Franz, to Bizerba-Werke Wilhelm Kraut KG. Method and system for determining the presence of objects within a particular surveillance area, in particular for prevention of shoplifting. 4,123,749, Cl. 340-572.000.

Hartmann, Peter J.: *See—*
Unrau, David G.; Portnoy, Norman A.; and Hartmann, Peter J., 4,123,398, Cl. 260-17.4CL.
Hartung, Kuhn & Co. Maschinenfabrik GmbH: *See—*
Schulte, Fritz; Riecker, Johann G.; and Rozas, Gunther, 4,123,333, Cl. 202-255.000.
Harvey, Geoffrey, to Girling Limited. Disc brakes for vehicles. 4,122,920, Cl. 188-73.400.
Harvey, Kenneth: *See—*
Baines, Eric; and Harvey, Kenneth, 4,123,517, Cl. 424-57.000.
Harvey, Robin J., to Hughes Aircraft Company. Elongated crossed-field switch device. 4,123,683, Cl. 313-156.000.
Hasegawa, Goro, to Canon, Inc. Electrically controlled photographic shutter. 4,123,766, Cl. 354-51.000.
Hasegawa, Tetuya; and Itishasi, Akihiro, to Pilot Man-Nen-hitsu Kabushiki Kaisha. Dry writing board possessing anti-halation effect and process for producing the same. 4,123,590, Cl. 428-450.000.
Haselkorn, Michael H.: *See—*
Brewer, David C.; Evans, James D.; Kohler, Dale M.; and Haselkorn, Michael H., 4,123,337, Cl. 204-129.300.
Hashimoto, Katuo, to Iida Sankyo Kabushiki Kaisha. Digital clock of leaf type. 4,122,659, Cl. 58-7.000.
Hashimoto, Shigeru: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.
Haskell, Theodore H.: *See—*
Behnke, Walter E.; Marsh, William R.; and Haskell, Theodore H., 4,123,609, Cl. 536-27.000.
Hass, Robert H., to Union Oil Company of California. Process for removing sulfur and NO_x components from a gas stream. 4,123,507, Cl. 423-573.00G.
Hasspacher, Klaus; and Strasser, Michael, to Sandoz Ltd. N-Propyl-3(β-hydroxyethyl)-3-(meta-hydroxyphenyl)-pyrrolidine. 4,123,545, Cl. 424-274.000.
Hatanaka, Minoru: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,123,611, Cl. 542-421.000.
Hatano, Takashi: *See—*
Kimura, Yoshiaki; Kawai, Masanori; and Hatano, Takashi, 4,123,761, Cl. 346-140.00R.
Hatch, Burton D.: *See—*
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., 4,123,677, Cl. 310-52.000.
Hatsuoka, Nobuyasu: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.
Hattori, Kiyoshi: *See—*
Shichida, Hiromichi; Gamo, Gotaro; Nomura, Yoshiyuki; Hattori, Kiyoshi; and Koiwai, Yutaka, 4,123,645, Cl. 219-69.00W.
Hattori, Kyo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Oil circulating and cooling system. 4,122,818, Cl. 123-196.0AB.
Havalda, Paul, to Ciba-Geigy Corporation. Method and apparatus for the liquid treatment of filter cakes. 4,123,360, Cl. 210-216.000.
Hayashida, Suetou: *See—*
Hori, Takashi; and Hayashida, Suetou, 4,123,371, Cl. 252-42.700.
Hayes, Terence J.: *See—*
Mitrovic, Milan; and Hayes, Terence J., 4,123,553, Cl. 424-311.000.
Haytayan, Harry M., to Pneutek, Inc. Pneumatic hammer driver. 4,122,904, Cl. 173-15.000.
Hayward, Christopher F.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., 4,123,523, Cl. 424-177.000.
Hegeman, Karl-Rudolf, to Gottfried Bischoff Bau Kompl. Gastreinigungs- und Wasserruckkuhlanlagen Kommanditgesellschaft. Flow-control nozzle for flue-gas scrubber. 4,123,238, Cl. 55-226.000.
Hehn, Wilfried: *See—*
Fernandez, Avelino; Glass, Josef; Osegowitsch, Viktor; and Hehn, Wilfried, 4,123,769, Cl. 354-322.000.
Heidelberger Druckmaschinen AG: *See—*
Wirz, Arno, 4,122,773, Cl. 101-230.000.
Heil, Walter P.; and Sclove, David B., to International Business Machines Corporation. Method of making electrophotographic imaging element. 4,123,270, Cl. 96-1.50R.
Heim, Ulrich; Leichnitz, Kurt; and Wiesner, Peter, to Dragerwerk Aktiengesellschaft. Method and apparatus for evaluating changes in indicator tubes. 4,123,227, Cl. 23-232.00R.
Heinemann Electric Company: *See—*
Hoagland, Porter, Jr., 4,123,737, Cl. 337-68.000.
Heines, M. Henry: *See—*
Campbell, Ramsey G.; Doane, Elliott P.; Heines, M. Henry; Naworski, Joseph S.; and Vogt, Harvey J., 4,123,467, Cl. 260-659.00A.
Heintze, York, to Fischer, Gertrude. Therapeutic copper compositions. 4,123,511, Cl. 424-46.000.
Heinze, Richard: *See—*
Pittasch, Willi, 4,122,581, Cl. 16-158.000.
Heiss, Herbert L.; Yeater, Robert P.; and Carter, Russell P., Jr., to Mobay Chemical Corporation. Stabilized thermoplastic polyesterurethanes. 4,123,419, Cl. 260-45.8NZ.
Heiss, Werner: *See—*
Andres, Rudolf; Busch, Gerhard; and Heiss, Werner, 4,123,104, Cl. 297-391.000.
Held, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Land mine of the hollow-charge type. 4,122,775, Cl. 102-8.000.
Helms, Thomas F., to Altek Company. Thermostat control. 4,123,739, Cl. 337-301.000.
Hendriks, Albertus G.: *See—*
Giles, Alan F.; and Hendriks, Albertus G., 4,122,941, Cl. 198-774.000.
Henkel Kommanditgesellschaft auf Aktien: *See—*
Altenschopfer, Theodor; and van Wageningen, Albertus, 4,123,375, Cl. 252-99.000.
Herbst, Norman R.: *See—*
Salzman, Ronald N.; and Herbst, Norman R., 4,123,178, Cl. 366-338.000.
Hercules Supply Company: *See—*
Newland, William M., 4,123,093, Cl. 285-189.000.
Herman, Arnold: *See—*
Kruger, Bernard M., 4,122,619, Cl. 40-365.000.
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T. Fused pyrimidine derivatives and compositions for treating atherosclerosis containing them. 4,123,533, Cl. 424-251.000.
Herold, Wilhelm; and Pickert, Johannes. Device for carburetion of liquid fuels. 4,123,481, Cl. 261-81.000.
Herschler, Michael G.: *See—*
Kathmann, Stephen J.; Post, Roger L.; Herschler, Michael G.; and Anerino, Sylvester L., 4,123,203, Cl. 417-252.000.
Hershenson, Fred M.: *See—*
Ellefson, Charles R.; and Hershenson, Fred M., 4,123,430, Cl. 260-243.300.
Herzog, Gunter, to Ernst Koch & Co. Arrangement for air cooling on drawing die drums. 4,122,698, Cl. 72-286.000.
Hesse, Gregory N.: *See—*
Comiskey, Gary F.; Hesse, Gregory N.; and Bovenlander, Johannes P., 4,123,674, Cl. 307-351.000.
Hibbel, Josef: *See—*
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,123,235, Cl. 55-85.000.
Hice, Jaxon O., to Research Associates Ltd. Method for flash cooking food. 4,123,560, Cl. 426-509.000.
Hicks, Janice R.: *See—*
Crowell, Florence S.; and Hicks, Janice R., 4,122,628, Cl. 46-135.00R.
Hickson, James P., to Torrington Company, The. Sewing machine needle. 4,122,788, Cl. 112-222.000.
Higgens, Calvin E.: *See—*
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,123,612, Cl. 544-16.000.
Hiki, Fumihiko: *See—*
Kita, Shinichiro; Hiki, Fumihiko; Shimizu, Masayuki; and Kondou, Akira, 4,123,600, Cl. 526-65.000.
Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, to U.S. Philips Corporation. Electrically controlled adjusting device for a light beam with digital and analog deflection control. 4,123,147, Cl. 350-285.000.
Hill, Bruce S., to Edenvale Engineering Works (Proprietary) Limited. Mining method. 4,123,109, Cl. 299-18.000.
Hill, Horace E., to Boeing Company, The. Double ended drill stop. 4,123,193, Cl. 408-202.000.
Hill, Robert H.: *See—*
Maier, Alfred E.; and Hill, Robert H., 4,123,734, Cl. 335-9.000.
Hilterhaus, Karl-Heinz; and Reuter, Franz G., to Chemie-Anlagenbau Bischofsheim GmbH; Reuter Technologie GmbH; and Metallgesellschaft. Foams from phenolic resins and isocyanates, and process for the manufacture thereof. 4,123,599, Cl. 521-123.000.
Hilti Aktiengesellschaft: *See—*
Jochum, Peter; and Schilter, Eugen, 4,122,987, Cl. 227-10.000.
Kuhlmann, Wolf; Rumpp, Gerhard; and Busler, Albert, 4,122,753, Cl. 85-74.000.
Himmelmann, Wolfgang: *See—*
Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.
Hinds, Robert J.: *See—*
Clements, Luther D.; Hannan, Michael D.; Hinds, Robert J.; and Vose, Richard W., 4,123,357, Cl. 210-71.000.
Hines, Marion E.; Stinehelfer, Harold E., Sr.; and Atchley, Dana W., Jr., to Microwave Associates, Inc. Phased array antenna. 4,123,759, Cl. 343-854.000.
Hines, Vernon C. Protective bushing to enclose the end of a conduit liner. 4,122,870, Cl. 138-109.000.
Hirabayashi, Masaya; Kawahara, Haruyuki; and Taniguchi, Yoshio, to Kyoto Ceramic Kabushiki Kaisha. Somatic element of single crystalline sapphire ceramics. 4,122,605, Cl. 32-10.00A.
Hirschfeld, T.; and Brown, David C.A.G., to Block Engineering Inc. Gas chromatograph device. 4,123,236, Cl. 55-197.000.
Hirschsohn, Ephraim: *See—*
Hirschsohn, Ladislav; and Hirschsohn, Ephraim, 4,122,832, Cl. 126-271.000.
Hirschsohn, Ladislav; and Hirschsohn, Ephraim. Solar collector. 4,122,832, Cl. 126-271.000.
Hisada, Yoshio: *See—*
Kameda, Nobuyuki; Hisada, Yoshio; Takayama, Chiyozo; Kato, Toshiro; and Fujinami, Akira, 4,123,549, Cl. 424-274.000.

Hitachi, Ltd.: *See*—
Imoto, Katsuyuki; Takasaki, Yoshitaka; and Sumi, Masao, 4,123,242, Cl. 65-11.00W.
Kajiwara, Toshiyuki; and Nishino, Tadashi, 4,123,011, Cl. 242-78.100.
Mitobe, Koichi; and Uehara, Yasuhiko, 4,123,563, Cl. 427-68.000.
Mochizuki, Taketoshi; Harada, Fumio; Imaizumi, Tadahiro; and Nose, Koichi, 4,122,688, Cl. 62-196.00R.
Okikawa, Susumu; Yukawa, Osamu; Mikino, Hiroshi; and Nonaka, Yoshio, 4,123,293, Cl. 148-11.50C.
Sanada, Takahiro; and Ochiai, Kanehiro, 4,123,324, Cl. 176-37.000.
Shinbo, Katsutoshi, 4,123,326, Cl. 176-68.000.
Sugimoto, Yoshikazu; Yusa, Hideo; Kato, Yomei; Kamiya, Kunio; and Kikuchi, Makoto, 4,123,356, Cl. 210-67.000.
Sugisaki, Toshihiko; Horiuchi, Tetsuo; Ogasawara, Hideo; Yamanari, Shozo; and Tominaga, Kenji, 4,123,327, Cl. 176-76.000.
Tsuchimoto, Takashi, 4,123,316, Cl. 156-643.000.
Hitachi Magnetics Corp.: *See*—
Johnson, C. Evan, 4,122,563, Cl. 4-236.000.
Hitchcock, Thomas H. Integrated universal tool. 4,122,569, Cl. 7-134.000.
Hjortzberg, Bernhard A., to BASF Aktiengesellschaft. Color signal encoding methods and apparatus for video recording and playback. 4,123,774, Cl. 358-4.000.
Hlavka, Joseph J.; and Bitha, Panayota, to American Cyanamid Company. Alkylated derivatives of antibiotic BM123γ. 4,123,607, Cl. 536-17.000.
Hoadley, Frederick E., to Ford Motor Company. Tool for machining clay. 4,123,186, Cl. 407-54.000.
Hoagland, Porter, Jr., to Heinemann Electric Company. Bimetallic circuit breaker. 4,123,737, Cl. 337-68.000.
Hoben, Blanche E. Mattress assembly to accommodate a bedpan. 4,122,565, Cl. 5-90.000.
Hochiki Corporation: *See*—
Kajii, Shigeru, 4,123,656, Cl. 250-381.000.
Hoechst Aktiengesellschaft: *See*—
Dorr, Hans W.; and Grosse, Ludwig, 4,123,593, Cl. 428-535.000.
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,123,385, Cl. 252-414.000.
Warning, Klaus; and Mitzlaff, Michael, 4,123,434, Cl. 260-296.00D.
Hoechst, Lonnie D.: *See*—
Bauer, James J.; and Hoechst, Lonnie D., 4,122,960, Cl. 214-140.000.
Hoellerich, John L., to Slingerland Drum Co. Marching timpani. 4,122,749, Cl. 84-419.000.
Hoffmann-La Roche Inc.: *See*—
Leimgruber, Willy; and Valentine, Donald H., Jr., 4,123,464, Cl. 260-601.00R.
Mitrovic, Milan; and Hayes, Terence J., 4,123,553, Cl. 424-311.000.
Valentine, Donald H., Jr., 4,123,465, Cl. 260-606.50P.
Hoffmann, Wilhelm, to Optima-Maschinenfabrik, Dr. Buehler KG. Apparatus for the weighing of mass produced articles. 4,122,940, Cl. 198-504.000.
Hokushin Electric Works, Ltd.: *See*—
Kobayashi, Tamotsu; and Futamura, Jun, 4,122,714, Cl. 73-194.0EM.
Holdiman, Joe W., to Scovill Manufacturing Company. Method of cladding a window product. 4,122,633, Cl. 49-501.000.
Hollander, Werner; and Schormann, Josef. Apparatus for analyzing the size distribution and quantity of small particles in an aerosol. 4,123,159, Cl. 356-38.000.
Holleran, John M.: *See*—
Pope, Thomas A.; and Holleran, John M., 4,123,301, Cl. 148-153.000.
Holley, Ronnie E., to Lane Container Company. Interfitting shipping pad. 4,122,946, Cl. 206-523.000.
Holliger, Herbert; and Wicki, Heinz, to Sandoz Ltd. Metallized polyazo dyes derived from a coupling component obtained by acidic condensation of formaldehyde with at least one phenolic compound. 4,123,428, Cl. 260-145.00C.
Holloway, Gale A.; Yeh, Rudolph; and Zagotta, Joseph L., to International Harvester Company. Hydraulic valve assembly having an axial flow force balanced spool. 4,122,868, Cl. 137-625.690.
Holmes, Roy L.: *See*—
Yiu, Joseph T.; and Holmes, Roy L., 4,123,717, Cl. 325-470.000.
Holt, Lloyd J.: *See*—
Panlaqui, Clayton E.; and Holt, Lloyd J., 4,122,754, Cl. 89-1.50B.
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, to Holter, Heinz. Process for the purification of gas generated in the pressure gasification of coal. 4,123,502, Cl. 423-230.000.
Holtermann, Theodore J., to Outboard Marine Corporation. Lawn mower blade clutch and brake. 4,122,652, Cl. 56-11.300.
Holub, Fred F.; Scott, Steven W.; and Wilson, Phillip S., to General Electric Company. Polycarbonate composition plasticized with esters. 4,123,436, Cl. 260-30.80R.
Holub, Fred F.: *See*—
Betts, Joseph E.; and Holub, Fred F., 4,123,586, Cl. 428-391.000.
Honjo, Yoshihiko, to Victor Company of Japan, Limited. Signal noise filtration for laser beam recording system. 4,123,780, Cl. 358-128.000.
Hooker Chemicals & Plastics Corp.: *See*—
Wagner, George M., 4,123,573, Cl. 427-324.000.
Wagner, George M., 4,123,574, Cl. 427-341.000.
Hoover, James M.: *See*—
Lutenegger, Alan J.; Handy, Richard L.; and Hoover, James M., 4,122,704, Cl. 73-822.000.
Hope Co., Ltd.: *See*—
Takahashi, Tohru, 4,123,084, Cl. 280-630.000.
Hopf, Werner G., to Teledyne Industries, Inc. Instrument for measuring preformed tubes. 4,122,607, Cl. 33-174.00L.
Hopf, Werner G., to Teledyne Industries, Inc. Tube feeler. 4,122,608, Cl. 33-174.00L.
Hopwood, Francis W.; and Staley, Lester K., to Westinghouse Electric Corp. Chirp phase distortion detector in a wideband linearization feedback control loop. 4,123,719, Cl. 328-155.000.
Hori, Takashi; and Hayashida, Suetou, to Maruzen Oil Co., Ltd. Process for preparing over-based sulfurized alkaline earth metal phenates. 4,123,371, Cl. 252-42.700.
Horiike, Yasuhiro, to Tokyo Shibaura Electric Co., Ltd. Gas-etching device. 4,123,663, Cl. 250-531.000.
Horiuchi, Tetsuo: *See*—
Sugisaki, Toshihiko; Horiuchi, Tetsuo; Ogasawara, Hideo; Yamanari, Shozo; and Tominaga, Kenji, 4,123,327, Cl. 176-76.000.
Horler, Hansulrich; and Perevuznik, Josef, to BBC Brown Boveri & Company Limited. Gas-dynamic pressure-wave machine. 4,123,200, Cl. 417-64.000.
Horvath, Agnes: *See*—
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, 4,123,533, Cl. 424-251.000.
Horwitz, Norman H., to William Beaumont Hospital. Optical alignment apparatus for teletherapy machine or the like. 4,123,660, Cl. 250-491.000.
Hosaka, Akio; and Tsuruta, Eiji, to Nissan Motor Company, Limited. System for detecting abnormality in fuel feed control system of gas turbine engine. 4,122,667, Cl. 60-39.09R.
Hosaka, Akio; and Sakamoto, Satoshi, to Nissan Motor Company, Limited. Ignition spark timing control system for an internal combustion engine. 4,122,807, Cl. 123-117.00R.
Hosaka, Akio; and Tsuruta, Eiji, to Nissan Motor Company, Limited. Bias current compensated operational amplifier circuit. 4,123,721, Cl. 330-69.000.
Hoshikawa, Masao: *See*—
Nakahara, Tsuneo; Hoshikawa, Masao; Shiraishi, Satoshi; Kurosaki, Shiro; and Fujiwara, Kunio, 4,123,483, Cl. 264-1.000.
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori. Range finder system. 4,123,650, Cl. 250-201.000.
Hou, Shou L., to Mead Corporation, The. Apparatus and method for jet deflection and recording. 4,123,760, Cl. 346-75.000.
Hough, W. Colton. Cord holder. 4,123,012, Cl. 242-85.100.
Hoult, David P., to Thermo Electron Corporation. Drainage foil element having two wire bearing portions. 4,123,322, Cl. 162-352.000.
Howarth, Thomas T., to Beecham Group Limited. Isoclavulanic acid as an antibacterial and a β-lactamase inhibitor. 4,123,540, Cl. 424-272.000.
Howell, Thomas H., to United States of America, Army. Laser optical lever adjunct. 4,123,168, Cl. 356-152.000.
Hruza, Denis E., Sr.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
Hsieh, Horng-Ming: *See*—
Radkowsky, Alvin; Chien, Ji-Peng; Yang, Chao-Yie; and Hsieh, Horng-Ming, 4,123,328, Cl. 176-78.000.
Huang, Kwang T.: *See*—
Paszyc, Aleksy J.; Shiroma, Dallas M.; and Huang, Kwang T., 4,123,697, Cl. 322-2.00A.
Huber, William J., to McGraw-Edison Company. High voltage current limiting fuse. 4,123,738, Cl. 337-159.000.
Hubers, Cornelis. Single stage or multi-stage expansion engine. 4,122,669, Cl. 123-200.000.
Hubert, Peter: *See*—
Vitzthum, Otto; and Hubert, Peter, 4,123,559, Cl. 426-312.000.
Hubert, Wallace L., to International Business Machines Corporation. Copy production machine having a duplex copy mode. 4,123,155, Cl. 355-26.000.
Hudson, John A.: *See*—
James, Nicholas A.; Hudson, John A.; Savage, Derek G.; and Morley, Edward G., 4,123,202, Cl. 417-216.000.
Huffy Corporation: *See*—
Ferlise, Louis; and Mackey, Sherman E., 4,123,189, Cl. 408-21.000.
Hughes Aircraft Company: *See*—
Harvey, Robin J., 4,123,683, Cl. 313-156.000.
Meyers, Franklin J., 4,123,134, Cl. 350-6.700.
Morrison, Robert J., 4,123,138, Cl. 350-96.210.
Wolf, Edward D.; and Perkins, Walter E., Jr., 4,123,661, Cl. 250-492.00A.
Hughes, Ernest R.: *See*—
Carlson, C. Burton; and Hughes, Ernest R., 4,123,175, Cl. 366-151.000.
Hughes, Richard S.: *See*—
Jernigan, James L.; Hughes, Richard S.; and Van Devender, Russell R., Jr., 4,123,728, Cl. 331-94.50L.
Hugley, Dale G. Safety closure apparatus for pressure vessels. 4,122,969, Cl. 220-256.000.
Hujik, Ladislav: *See*—
Schilke, Waldemar; and Hujik, Ladislav, 4,123,493, Cl. 264-244.000.

Hults, Harold W., to Cutler-Hammer, Inc. Snap-action switch with contact wiping action. 4,123,634, Cl. 200-67.00A.

Humphries, William H.: *See—*
Koht, Lowell I.; Kinsch, Michael J., Jr.; and Humphries, William H., 4,123,047, Cl. 269-238.000.

Hundt, Dieter; Gruber, Wolfgang; Klarwein, Michael; and Roeschlau, Peter, to Boehringer Mannheim GmbH. Control serum containing alkaline phosphatase of constant activity. 4,123,384, Cl. 252-408.000.

Hunter, Robert F., to Steel Company of Canada, Limited, The. Tubeless heat recuperator. 4,122,823, Cl. 126-117.000.

Huntington, Robert G., to American Air Filter Company, Inc. Adjustable tensioning and retaining device. 4,123,027, Cl. 248-327.000.

Hurst, Richard F. Label stripping machine. 4,122,734, Cl. 82-1.00C.

Husqvarna AB: *See—*
Engman, Thomas; Ericsson, Dan; and Landen, Goran, 4,122,741, Cl. 83-834.000.

Hy-Gain De Puerto Rico, Inc.: *See—*
Yiu, Joseph T.; and Holmes, Roy L., 4,123,717, Cl. 325-470.000.

Hyggen, Egil, to Elkem-Spigerverket A/S. Auxiliary gripping members for gripping shoes for vehicle wheels. 4,122,880, Cl. 152-216.000.

Hyggen, Egil, to Elkem-Spigerverket A/S. Gripping shoes for vehicle wheels. 4,122,881, Cl. 152-216.000.

Hynek, Stanley: *See—*
Frey, Fred J.; Hynek, Stanley; and Losinski, Edward, 4,123,105, Cl. 297-451.000.

Hyre, Robert W. Improvements in concrete roadway-slab forming and form-elevation adjusting means. 4,123,031, Cl. 249-24.000.

Hyster Company: *See—*
Moshofsky, Jerome F.; and Vanderzanden, Allan J., 4,122,819, Cl. 123-198.00D.

Ichiki, Tadaharu; Shiho, Eiji; and Kitagawa, Koji, to Tokyo Shibaura Denki Kabushiki Kaisha. Containers for housing nuclear reactors. 4,123,325, Cl. 176-38.000.

Ichioka, Satoshi: *See—*
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.

Ichiugi, Isamu. Selectable fraction of revolution tape recorder. 4,123,784, Cl. 360-100.000.

Igelbuscher, Heinrich: *See—*
Holter, Heinz; Gresch, Heinz; and Igelbuscher, Heinrich, 4,123,502, Cl. 423-230.000.

Ihde, Frederick J., Jr., to Diamond Shamrock Corporation. Silica based defoamer compositions having improved stability. 4,123,383, Cl. 252-321.000.

Iida Sankyo Kabushiki Kaisha: *See—*
Hashimoto, Katuo, 4,122,659, Cl. 58-7.000.

Ilett, Keith J.: *See—*
Wyatt, Kenneth L.; and Ilett, Keith J., 4,123,482, Cl. 261-91.000.

Illinois Tool Works Inc.: *See—*
Flair, Henry J., 4,122,609, Cl. 33-174.00P.

Imai, Kimiaki: *See—*
Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, 4,123,257, Cl. 75-40.000.

Imaizumi, Tadahiro: *See—*
Mochizuki, Taketoshi; Harada, Fumio; Imaizumi, Tadahiro; and Nose, Koichi, 4,122,688, Cl. 62-196.00R.

Imoto, Katsuyuki; Takasaki, Yoshitaka; and Sumi, Masao, to Hitachi, Ltd. Apparatus for producing optical fiber. 4,123,242, Cl. 65-11.00W.

Imperial Chemical Industries Limited: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., 4,123,523, Cl. 424-177.000.

Imperial-Eastman Corporation: *See—*
Kotsakis, Mike D.; and Schwarz, Albert J., 4,123,090, Cl. 285-39.000.

Imperial Metal Industries (Kynoch) Limited: *See—*
Gidley, John A. F., 4,123,572, Cl. 427-272.000.

Inaba, Yoshihito: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.

Inagaki, Syotaro: *See—*
Takeuchi, Koji; and Inagaki, Syotaro, 4,122,981, Cl. 222-231.000.

Industrial Electrical Control Corporation: *See—*
Laird, Dale E., 4,123,148, Cl. 350-293.000.

Industrie Pirelli S.p.A.: *See—*
Gallizia, Achille; and Bandel, Paolo, 4,123,496, Cl. 264-329.000.

Industriewerk Schaeffler OHG: *See—*
Grimm, Robert; and Koschmieder, Hartmut, 4,122,589, Cl. 29-148.40C.

Ing. C. Olivetti & C., S.p.A.: *See—*
Bovio, Michele, 4,123,653, Cl. 250-231.0SE.

Ingenium Ingenieurgesellschaft fur Mehrzweckbauten, Industrieanlagen und Gelandenutzung mbH Bau-Kommanditgesellschaft: *See—*
Teschner, Horst, 4,123,032, Cl. 249-29.000.

Ingram, John D., to Schlumberger Technology Corporation. Method and apparatus for dynamically investigating a borehole. 4,123,744, Cl. 340-15.5TN.

Inoue, Komei; and Kosaka, Tosihisa, to Glory Kogyo Kabushiki Kaisha. System for controlling coin-operated lockers. 4,122,935, Cl. 194-32.000.

Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, to Mitsubishi Chemical Industries Limited; and Nippon Shinyaku Company, Limited. 2-Aminomethyl-5-phenyloxazoles and the pharmaceutically acceptable salts thereof. 4,123,541, Cl. 424-272.000.

Inowa, Shigeru; Nakamura, Issei; and Furuya, Tutomu, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for forming an electrostatic latent image using an iron control grid with dual electrical fields. 4,123,156, Cl. 355-3.0SC.

Institut de Recherches de la Siderurgie Francaise: *See—*
Michelet, Jacques; and Zanetta, Hugues, 4,123,045, Cl. 266-275.000.

Institute of Nuclear Energy Research, Atomic Energy Council: *See—*
Radkowsky, Alvin; Chien, Ji-Peng; Yang, Chao-Yie; and Hsieh, Horng-Ming, 4,123,328, Cl. 176-78.000.

Instructional/Communications Technology, Inc.: *See—*
Brucat, John N., 4,123,153, Cl. 352-191.000.

International Business Machines Corporation: *See—*
Balog, Moshe; Berkenblit, Melvin; Chan, See-Ark; and Reisman, Arnold, 4,123,571, Cl. 427-249.000.
Devine, William T.; and Washburn, William F., 4,123,669, Cl. 307-205.000.
Heil, Walter P.; and Sclove, David B., 4,123,270, Cl. 96-1.50R.
Hubert, Wallace L., 4,123,155, Cl. 355-26.000.
Joshi, Madhukar L.; Landler, Paul F.; and Silverman, Ronald, 4,123,300, Cl. 148-187.000.
Lancto, Donald C.; and Shuck, Robert E., 4,123,747, Cl. 340-149.00A.
Rabedeau, Melbourne E., 4,123,135, Cl. 350-6.800.

International Flavors & Fragrances Inc.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
Sprecker, Mark A., 4,123,469, Cl. 260-668.00F.

International Harvester Company: *See—*
Holloway, Gale A.; Yeh, Rudolph; and Zagotta, Joseph L., 4,122,868, Cl. 137-625.690.
Zagotta, Joseph L., 4,122,867, Cl. 137-625.300.

International Nickel Company, Inc., The: *See—*
Kilpinen, Leo T., 4,123,009, Cl. 241-30.000.

International Radio & Electronics, Inc.: *See—*
Eger, Donald M., 4,123,010, Cl. 242-68.300.

International Standard Electric Corporation: *See—*
Drake, Cyril F., 4,123,248, Cl. 71-4.000.

International Telephone and Telegraph Corporation: *See—*
Unrau, David G.; Portnoy, Norman A.; and Hartmann, Peter J., 4,123,398, Cl. 260-17.4CL.

Internationale Octrooi Maatschappij "OCTROPA" B.V.: *See—*
Giles, Alan F.; and Hendriks, Albertus G., 4,122,941, Cl. 198-774.000.

InterRoyal Corporation: *See—*
Frey, Fred J.; Hynek, Stanley; and Losinski, Edward, 4,123,105, Cl. 297-451.000.

Iowa State University Research Foundation: *See—*
Lutenegger, Alan J.; Handy, Richard L.; and Hoover, James M., 4,122,704, Cl. 73-822.000.

Irwin, Howard D. Drag force knotmeter. 4,122,711, Cl. 73-184.000.

Ishihara, Takamasa: *See—*
Oyamada, Takeo; Satoh, Kazuhisa; Tomizawa, Choji; and Ishihara, Takamasa, 4,123,405, Cl. 260-29.60R.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Isshiki, Naotsugu; Nikai, Isao; and Uchida, Hiroyuki, 4,122,680, Cl. 60-649.000.

Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, to Osaka University, President of. N-protected amino compounds. 4,123,611, Cl. 542-421.000.

Isono, Tadao, to Nihon Beru-Haueru Kabushiki Kaisha. Automatic focus adjusting device. 4,123,765, Cl. 354-25.000.

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Itek Corporation: *See—*
Jacobs, Robert D., 4,123,049, Cl. 271-225.000.

Itishasi, Akihiro: *See—*
Hasegawa, Tetuya; and Itishasi, Akihiro, 4,123,590, Cl. 428-450.000.

Ito, Katsuo; and Yoshimura, Kazunori, to Murata Manufacturing Co., Ltd. Television tuner with fine tuning means. 4,123,781, Cl. 358-191.000.

Itoh, Masuko: *See—*
Itoh, Shiuta; Itoh, Masuko; and Kitaura, Masato, 4,123,770, Cl. 354-337.000.

Itoh, Shiuta; Itoh, Masuko; and Kitaura, Masato. Process and apparatus for developing photographs. 4,123,770, Cl. 354-337.000.

ITT Industries, Inc.: *See—*
Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, 4,123,694, Cl. 318-443.000.

Iwanaga, Sumio: *See—*
Yamamoto, Masao; and Iwanaga, Sumio, 4,123,352, Cl. 209-546.000.

Iwasa, Yoshio, to Nissan Motor Company, Limited. Air-fuel ratio control system. 4,122,809, Cl. 123-119.0EC.

Iwasaki, Tetsuji; Miyamoto, Norioki; Sugimura, Yukio; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, to Kao Soap Co., Ltd. Germicidal herbicide for agriculture and horticulture. 4,123,254, Cl. 71-98.000.

Iwashita, Tomonori: *See*—
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.

Jackson, Barry; and Zinsstag, Christoph, to Lonza, Ltd. Process for the production of monohaloacetylhalides. 4,123,460, Cl. 260-544.00D.

Jacobi, Haireddin: *See*—
Lange, Fritz-Walter; Jacobi, Haireddin; and Muller, Jens, 4,123,548, Cl. 424-274.000.

Jacobs, Eugene A. Ventilating, cooling and heat reclaiming apparatus for cooking equipment. 4,122,834, Cl. 126-299.00D.

Jacobs, Robert D., to Itek Corporation. Printing plate transfer apparatus. 4,123,049, Cl. 271-225.000.

Jacoby, Thomas A., to Tecumseh Products Company. Laminated stator core member secured only by bonding the windings. 4,123,678, Cl. 310-217.000.

Jaeger, Kurt S.: *See*—
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,123,220, Cl. 431-353.000.

Jagielski, David: *See*—
Persha, Thomas J.; and Jagielski, David, 4,123,699, Cl. 353-26.00R.

James, Kelly W.: *See*—
Safrit, Sam C.; James, Kelly W.; and Bullock, Roger D., 4,122,555, Cl. 2-401.000.

James, Nicholas A.; Hudson, John A.; Savage, Derek G.; and Morley, Edward G., to Plessey Handel und Investments AG. Hydraulic pumping arrangements. 4,123,202, Cl. 417-216.000.

Jamieson, William B.: *See*—
Verge, John P.; and Jamieson, William B., 4,123,529, Cl. 424-250.000.

Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., to General Motors Corporation. Forming curved thin magnets from rare earth-transition metal powders. 4,123,297, Cl. 148-103.000.

Jansen, Willi: *See*—
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,123,235, Cl. 55-85.000.

Janssen, Johannes H. H., to U.S. Philips Corporation. Multisegment Hall element for offset voltage compensation. 4,123,772, Cl. 357-27.000.

Japan Metals & Chemicals, Co., Ltd.: *See*—
Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, 4,123,257, Cl. 75-40.000.

Jarrett, Ronald T.; and Barrett, Edward J., to Jarrett, Ronald T.; Barrett, Edward J.; and Curran, D. Michael. Method of producing pressed hay pellets. 4,122,767, Cl. 100-35.000.

Jeffers, Frederick J.: *See*—
Moeller, Charles R.; and Jeffers, Frederick J., 4,123,790, Cl. 360-111.000.

Jeker, Rudolf: *See*—
Schmid, Gunter; and Jeker, Rudolf, 4,123,312, Cl. 156-466.000.

Jelenevsky, Alex M.: *See*—
Buchanan, Ronald L.; Woolever, John T.; and Jelenevsky, Alex M., 4,123,440, Cl. 260-326.280.

Jernigan, James L.; Hughes, Richard S.; and Van Devender, Russell R., Jr., to United States of America, Navy. Electrogenerated chemiluminescent (ECL) laser. 4,123,728, Cl. 331-94.50L.

Jerry, Frederick L. Car hand spray washer. 4,123,004, Cl. 239-310.000.

Jessop, Quenton W. Chain. 4,122,666, Cl. 59-80.000.

Jochum, Peter; and Schilter, Eugen, to Hilti Aktiengesellschaft. Damping device for a fastening element setting gun. 4,122,987, Cl. 227-10.000.

Joelson, Carl R. Apparatus for forming hollow cylindrical pipes of reinforced concrete. 4,123,033, Cl. 249-65.000.

Johansen, Thomas R.: *See*—
Fleming, David L.; Johansen, Thomas R.; and Torok, Ernest J., 4,123,142, Cl. 350-162.0SF.

Johansson, Lars O., to Aktiebolaget Atomenergi. Self-powered neutron detector. 4,123,658, Cl. 250-390.000.

Johansson, Nils G. Rear view mirror. 4,123,030, Cl. 248-478.000.

Johansson, Rolf A. G., to Jonsereds AB. Throttle control mechanism for a carburetor. 4,123,480, Cl. 261-52.000.

John R. Nalbach Engineering Co., Inc.: *See*—
Nalbach, John C., 4,122,876, Cl. 141-150.000.

Johnson, C. Evan, to Hitachi Magnetics Corp. Toilet seat assembly. 4,122,563, Cl. 4-236.000.

Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., to Ex-Cell-O Corporation. Self-locking chuck. 4,122,755, Cl. 90-11.00A.

Johnson, James F., to Packard Instrument Company, Inc. Centering mechanism for movable member within a variable-width passageway. 4,122,936, Cl. 198-339.000.

Johnson, Kenneth C., to Sperry Rand Corporation. Frequency deviation digital display circuit. 4,123,704, Cl. 324-78.00Z.

Johnson, Matthey & Co., Limited: *See*—
Acres, Gary J. K.; and Bird, Alfred J., 4,123,500, Cl. 423-35.000.

Johnson, Randall S., to PPG Industries, Inc. Shaping and quenching glass sheets by roll forming using transition quench rolls. 4,123,246, Cl. 65-104.000.

Johnson, Roy A., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,123,441, Cl. 260-345.200.

Johnston, James D.; Tuggle, Richard H., Jr.; Burch, John L.; and Clark, Keith H., to United States of America, National Aeronautics and Space Administration. Apparatus for assembling space structure. 4,122,991, Cl. 228-13.000.

Jolly, James D. Versatile dispensing dental hygiene and shaving device. 4,122,983, Cl. 222-390.000.

Jondet, Andre: *See*—
Kornowski, Henri; Roques, Bernard; Oberlin, Robert; and Jondet, Andre, 4,123,544, Cl. 424-274.000.

Jones, Derrell G.: *See*—
Bieringer, Harold F.; Jones, Derrell G.; and Schwartzkopf, Gary S., 4,122,758, Cl. 92-23.000.

Jones, Duane A., to General Mills Chemicals, Inc. Agglomeration of starch-hydrolyzed polyacrylonitrile graft copolymer. 4,123,397, Cl. 260-17.4GC.

Jones, Eric; and Townsend, Rodney P., to English Electric Valve Company Limited. Combustible gas detectors. 4,123,225, Cl. 422-98.000.

Jones, Kenneth C.: *See*—
Grinstead, Robert R.; Jones, Kenneth C.; and Nasutavicus, Wilmonte A., 4,123,435, Cl. 260-307.00D.

Jones, Robert C.: *See*—
LaConti, Anthony B.; Torkildsen, Robert A.; and Jones, Robert C., 4,123,700, Cl. 324-29.000.

Jones, Robert N.: *See*—
Von Hoene, Donald C.; Chu, Joseph Y. C.; Chen, Inan; and Jones, Robert N., 4,123,269, Cl. 96-1.0PC.

Jonsereds AB: *See*—
Johansson, Rolf A. G., 4,123,480, Cl. 261-52.000.

Jonsson, Nils A.; Mikiver, Lembit; and Moses, Pinchas, to AB Kabi. Derivatives of substituted indoline lactans with effect on the central nervous system. 4,123,543, Cl. 424-274.000.

Josefsen, Turi L. H.; and Veth, George J., to United States Surgical Corporation. Disposable sample card having a well with electrodes for testing a liquid sample. 4,123,701, Cl. 324-30.00B.

Joseph, Raymond, to Ateliers Reunis Societe Anonyme. Goods transport cart with molded plastic panel. 4,123,077, Cl. 280-47.340.

Joshi, Madhukar L.; Landler, Paul F.; and Silverman, Ronald, to International Business Machines Corporation. Integrated circuit process utilizing lift-off techniques. 4,123,300, Cl. 148-187.000.

Joswig, Siegfried, to Wolf-Gerate GmbH. Method and apparatus for the regeneration of lawn surfaces in particular of grass sport pitches. 4,122,784, Cl. 111-3.000.

Jozic, Ljerka: *See*—
Credner, Karl; Brenner, Gunter; Tauscher, Manfred; and Jozic, Ljerka, 4,123,534, Cl. 424-253.000.

Jozsef, Tibor: *See*—
Riley, Ralph V.; Muir, Samuel; Bloor, Christopher; and Jozsef, Tibor, 4,123,264, Cl. 75-211.000.

JPX: *See*—
Midzutani, Wataru; Nakajima, Koe; Kikuma, Toshio; Ondo, Keitaku; and JPX, 4,122,696, Cl. 72-52.000.

Jumonji, Shigeru: *See*—
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.

Jutte, Hans: *See*—
Follert, Hans G.; Linde, Klaus; and Jutte, Hans, 4,122,683, Cl. 405-142.000.

Kaaz Machinery Co., Ltd.: *See*—
Katsuya, Kazunari, 4,122,601, Cl. 30-296.00A.

Kabushiki Kaisha Famy: *See*—
Murakami, Mitsuo, 4,123,078, Cl. 280-87.02W.

Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho: *See*—
Yokoyama, Tohei; and Urayama, Kiyoshi, 4,122,715, Cl. 73-228.000.

Kabushiki Kaisha Mitachi Onkyo Seisakusho: *See*—
Minamizono, Tsugikuma, 4,123,067, Cl. 274-37.000.

Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Komatsu, Fumito; and Yazima, Shinkichi, 4,123,015, Cl. 242-191.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Tsuji, Masuo, 4,122,661, Cl. 58-23.00R.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Muto, Toshiya, 4,123,632, Cl. 200-61.270.

Kaelble, David H., to Rockwell International Corporation. Sealing material for use in contact with animal tissue. 4,123,409, Cl. 260-29.1SB.

Kaimins, Laimons: *See*—
Keem, Phillip W.; Kaimins, Laimons; and Graham, James, 4,123,197, Cl. 415-123.000.

Kaiser Aluminum & Chemical Corporation: *See*—
Commins, Alfred D.; Kindelvich, Frederick T.; and Schroter, Richard C., 4,122,640, Cl. 52-248.000.

Kajihara, Hiroshi: *See*—
Tasaki, Yoshio; Nakayama, Noboru; and Kajihara, Hiroshi, 4,122,990, Cl. 228-2.000.

Kajii, Shigeru, to Hochiki Corporation. Storage type smoke detector. 4,123,656, Cl. 250-381.000.

Kajiwara, Toshiyuki; and Nishino, Tadashi, to Hitachi, Ltd. Coil unwind and wind-up method and apparatus therefor. 4,123,011, Cl. 242-78.100.

Kamath, Venkatesh: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.

Kameda, Nobuyuki; Hisada, Yoshio; Takayama, Chiyozo; Kato, Toshiro; and Fujinami, Akira, to Sumitomo Chemical Company, Limited. N-(3,5-dihalophenyl)-α-spirocycloalkanesuccinimides, and their preparation and use. 4,123,549, Cl. 424-274.000.

Kameyama, Teruhiko: *See*—
Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, 4,123,257, Cl. 75-40.000.

Kamiya, Kunio: *See*—
Sugimoto, Yoshikazu; Yusa, Hideo; Kato, Yomei; Kamiya, Kunio; and Kikuchi, Makoto, 4,123,356, Cl. 210-67.000.

Kammel, Roland; and Lieber, Hans-Wilhelm, to Gotzelmann KG Industrieabwasser-Anlagen. Method and apparatus for treating metal containing waste water. 4,123,340, Cl. 204-149.000.

Kamoshita, Katsuzo: *See*—
Yoshida, Ryo; Takemoto, Ichiki; Sumida, Seizo; and Kamoshita, Katsuzo, 4,123,256, Cl. 71-105.000.

Kamyr, Inc.: *See*—
Sherman, Michael I., 4,123,318, Cl. 162-19.000.

Kanbara, Tohru; Uemura, Michihiko; and Yokoo, Nobuhiro, to Asahi Glass Company, Ltd. Glass for use in ultrasonic delay lines. 4,123,731, Cl. 333-30.00R.

Kaneda, Tsugio: *See*—
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Tanaka, Tsutomu; Nakamura, Yoshio; Asahi, Koji; Shiraishi, Tadayoshi; and Takahara, Kenji, 4,123,329, Cl. 195-28.00R.

Kang, Jung W.: *See*—
Snyder, Dennis L.; Stayer, Mark L., Jr.; and Kang, Jung W., 4,123,503, Cl. 423-300.000.

Kanigan, Frederick R., to Raymond Lee Organization, Inc., The, a part interest. Hand auger. 4,122,905, Cl. 175-396.000.

Kao Soap Co., Ltd.: *See*—
Iwasaki, Tetsuji; Miyamoto, Norioki; Sugimura, Yukio; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,123,254, Cl. 71-98.000.

Kapitanov, Nikolai N.; Kolosova, Svetlana V.; Kolesnikov, Vyacheslav D.; and Kharchenko, Vladimir P. Instrument for suturing with metal staples. 4,122,989, Cl. 227-108.000.

Karalis, Victor L., to Uniroyal, Inc. Method of making footwear. 4,122,574, Cl. 12-142.0RS.

Karalus, George C.; and Parker, Robert R., to Bell & Howell Company. Operator responsive audio-visual teaching apparatus. 4,122,613, Cl. 35-9.00A.

Karasawa, Shuichi: *See*—
Tomita, Satoru; Ohori, Tamio; and Karasawa, Shuichi, 4,123,762, Cl. 346-155.000.

Karino, Yukio; Sakaguchi, Shinji; and Yoshida, Takashi, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic materials with vinyl copolymer neutralization rate controlling layer. 4,123,275, Cl. 96-77.000.

Karki, Kenneth A., to Martin Marietta Corporation. Process for forming an optical black surface and surface formed thereby. 4,123,591, Cl. 428-454.000.

Karlsson, Lars P. Apparatus for controlling the sound generation in the loudspeakers of intercommunicating telephone sets in response to speech signals from the microphones of said telephone sets. 4,123,620, Cl. 179-1.0CN.

Karrer, Friedrich, to Ciba-Geigy Corporation. Insecticidal composition. 4,123,556, Cl. 424-341.000.

Kasperkovitz, Wolfdietrich G., to U.S. Philips Corporation. Circuit arrangement for frequency division of high-frequency pulses. 4,123,672, Cl. 307-303.000.

Katayama Chemical Works Co., Ltd.: *See*—
Osamu, Umekawa; Koji, Takemori; and Sakae, Katayama, 4,123,443, Cl. 260-347.400.

Katayama, Masao; and Tabeta, Yataro, to Mitsubishi Gas Chemical Company, Inc.; and Daiichi Kasei Sangyo. Process for decomposing microbial cells. 4,123,426, Cl. 260-112.00R.

Katchman, Arthur, to General Electric. Polyphenylene ether resin compositions containing a diphenylamine. 4,123,474, Cl. 260-874.000.

Katchman, Arthur: *See*—
Abolins, Visvaldis; and Katchman, Arthur, 4,123,475, Cl. 260-874.000.

Kathmann, Stephen J.; Post, Roger L.; Herschler, Michael G.; and Anerino, Sylvester L., to Gardner-Denver Company. Multistage helical screw compressor with liquid injection. 4,123,203, Cl. 417-252.000.

Kato, Masahiko; Katogi, Hisao; and Seki, Ikuo, to Toppan Printing Co., Ltd. Density measuring device. 4,123,171, Cl. 356-175.000.

Kato, Toshiro: *See*—
Kameda, Nobuyuki; Hisada, Yoshio; Takayama, Chiyozo; Kato, Toshiro; and Fujinami, Akira, 4,123,549, Cl. 424-274.000.

Kato, Yomei: *See*—
Sugimoto, Yoshikazu; Yusa, Hideo; Kato, Yomei; Kamiya, Kunio; and Kikuchi, Makoto, 4,123,356, Cl. 210-67.000.

Katogi, Hisao: *See*—
Kato, Masahiko; Katogi, Hisao; and Seki, Ikuo, 4,123,171, Cl. 356-175.000.

Katoh, Sanao: *See*—
Tanimoto, Akira; Katoh, Sanao; and Yoshida, Yukihiro, 4,122,786, Cl. 112-158.00E.

Katscher, Erich: *See*—
Weber, Robert; Katscher, Erich; and Schabert, Hans-Peter, 4,123,323, Cl. 176-30.000.

Katsuya, Kazunari, to Kaaz Machinery Co., Ltd. Portable separable grass and bush cutter. 4,122,601, Cl. 30-296.00A.

Kawabata, Toshihiko: *See*—
Fukuda, Kiyou; Kawabata, Toshihiko; and Asai, Kiyotsugu, 4,123,412, Cl. 260-30.8DS.

Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, to Kumiai Chemical Industry Co., Ltd. Fungicidal and germicidal benzanilides. 4,123,554, Cl. 424-324.000.

Kawahara, Haruyuki: *See*—
Hirabayashi, Masaya; Kawahara, Haruyuki; and Taniguchi, Yoshio, 4,122,605, Cl. 32-10.00A.

Kawai, Masanori: *See*—
Kimura, Yoshiaki; Kawai, Masanori; and Hatano, Takashi, 4,123,761, Cl. 346-140.00R.

Kawamura, Masatada; and Yamane, Hiroyuki, to Kurashiki Boseki Kabushiki Kaisha. Ultrasonic sound source and method for manufacturing rectangular diaphragm of ultrasonic sound source. 4,122,797, Cl. 116-137.00A.

Kawasaki, Masahiro: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,123,764, Cl. 354-24.000.

Kawasaki, Midori: *See*—
Sato, Shunichi; Kawasaki, Midori; and Kunii, Mamoru, 4,123,123, Cl. 312-1.000.

Keem, Phillip W.; Kaimins, Laimons; and Graham, James, to Allware Agencies Limited. Fan with air directing grille. 4,123,197, Cl. 415-123.000.

Keinanen, Henry J., to Continental Can Company, Inc. Arc welding system. 4,123,646, Cl. 219-137.00R.

Keller, James R.; and Nickerson, William A., to Wm. A. Nickerson & Co., Ltd. Machine for assembling wood I-beams. 4,123,315, Cl. 156-560.000.

Keller, Roderich; and Muller, Michael, to Gesellschaft fur Schwerionenforschung mbH. Ion generating source. 4,123,686, Cl. 313-230.000.

Kelley, Joseph A., to Flett Development Company. Method for converting waste paper products into useful forms. 4,123,489, Cl. 264-141.000.

Kellum, Gene E.; and Thompson, Jack W., to Gulf Oil Corporation. Catalyst feeding apparatus. 4,123,601, Cl. 526-79.000.

Kelly, David B. Shower screens. 4,122,559, Cl. 4-149.000.

KemaNobel AB: *See*—
Bjorklund, James Axel C.; and Ekengren, Turid, 4,123,319, Cl. 162-158.000.

Kemper, Daryl M.; and Dick, Louis A., to Tyco Crystal Products, Inc. Piezoelectric quartz crystal products and fabrication methods therefor. 4,123,680, Cl. 310-320.000.

Kendrick, Theodore T. Fire rescue equipment. 4,122,917, Cl. 182-144.000.

Kenkare, Divaker B.; Robbins, Clarence R.; and Carson, John C., Jr., to Colgate-Palmolive Company. Dispensing. 4,122,976, Cl. 222-94.000.

Kennedy, Alexander W., to Diamond Shamrock Corporation. Chromium-containing coating of enhanced corrosion resistance. 4,123,290, Cl. 148-6.200.

Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., to Chevron Research Company. Compositions for preserving crops and animal feedstuffs. 4,123,552, Cl. 424-311.000.

Keresman, Michael A.; and Schueuerman, Curtis H., to Parker-Hannifin Corporation. Means for intercepting weld splatter. 4,123,240, Cl. 55-385.00C.

Kern, Kenneth E.; and Richmond, James W., to General Time Corporation. Timer switch assembly. 4,123,628, Cl. 200-38.0FB.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Schnez, Harald, 4,123,484, Cl. 264-0.500.

Kerr Glass Manufacturing Corporation: *See*—
Roy, Gerald L., 4,122,965, Cl. 215-344.000.

Kerr, Ralph O.; and Barone, Bruno J., to Denka Chemical Corporation. Catalyst and process for preparing maleic anhydride from C_4 hydrocarbons. 4,123,388, Cl. 252-437.000.

Kharchenko, Vladimir P.: *See*—
Kapitanov, Nikolai N.; Kolosova, Svetlana V.; Kolesnikov, Vyacheslav D.; and Kharchenko, Vladimir P., 4,122,989, Cl. 227-108.000.

Kharitonov, Ivan I.: *See*—
Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I., 4,123,735, Cl. 336-30.000.

Kieserling & Albrecht: *See*—
Pauls, Kurt, 4,122,572, Cl. 10-105.000.

Kikuchi, Makoto: *See*—
Sugimoto, Yoshikazu; Yusa, Hideo; Kato, Yomei; Kamiya, Kunio; and Kikuchi, Makoto, 4,123,356, Cl. 210-67.000.

Kikuchi, Toshiro: *See*—
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.

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Midzutani, Wataru; Nakajima, Koe; Kikuma, Toshio; Ondo, Keitaku; and JPX, 4,122,696, Cl. 72-52.000.

Kikut, Edmundo. Apparatus for extracting energy from wave motion. 4,122,676, Cl. 60-398.000.

Killig, Klaus: *See*—
Reiss, Karl-Hans; and Killig, Klaus, 4,123,654, Cl. 250-272.000.

Kilpinen, Leo T., to International Nickel Company, Inc., The. Load sensor for a grinding mill. 4,123,009, Cl. 241-30.000.

Kilshaw, Edna M., legal representative: *See*—
Kilshaw, James, deceased; and Dervin, Edward, 4,123,768, Cl. 354-292.000.

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and apparatus for photographically recording three-dimensional models of dental arch profiles. 4,123,768, Cl. 354-292.000.

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Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Kimoto, Kyoji; and Masuda, Yoshinori, 4,123,336, Cl. 204-98.000.

Kimura, Yoshiaki; Kawai, Masanori; and Hatano, Takashi, to Konishiroku Photo Industry Co., Ltd. Method of purging ink passages of an ink jet recording device. 4,123,761, Cl. 346-140.00R.

Kinanen, Ilmari; and Duncker, Jim. Method for classifying and measuring of timbers. 4,123,702, Cl. 324-58.50A.

Kindelvich, Frederick T.: *See—*
Commins, Alfred D.; Kindelvich, Frederick T.; and Schroter, Richard C., 4,122,640, Cl. 52-248.000.

King, William R. Brake control method and apparatus for railway cars. 4,123,115, Cl. 303-22.00R.

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Kitagawa, Koji: *See—*
Ichiki, Tadaharu; Shiho, Eiji; and Kitagawa, Koji, 4,123,325, Cl. 176-38.000.

Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Control device for television camera. 4,123,782, Cl. 358-210.000.

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Itoh, Shiuta; Itoh, Masuko; and Kitaura, Masato, 4,123,770, Cl. 354-337.000.

Kiyono, Tetsuhiro; Nakamura, Moritoshi; and Nakanowatari, Jun, to Alps Electric Co., Ltd. Resistance element for variable resistors. 4,123,741, Cl. 338-121.000.

Klapdar, Wilhelm; Richter, Helmut; Rommerswinkel, Heinrich-Wilhelm; Spetzler, Edgar; and Wendorff, Jochen, to Thyssen Niederrhein. Process for the production of steel with increased ductility and for the desulfurization of a steel melt. 4,123,258, Cl. 75-58.000.

Klar, Irwin: *See—*
Rock, Erwin H.; and Klar, Irwin, 4,122,841, Cl. 128-2.00Z.

Klarwein, Michael: *See—*
Hundt, Dieter; Gruber, Wolfgang; Klarwein, Michael; and Roeschlau, Peter, 4,123,384, Cl. 252-408.000.

Klaubert, Dieter H.: *See—*
Sellstedt, John H.; and Klaubert, Dieter H., 4,123,432, Cl. 260-293.690.

Klauke, Erich: *See—*
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,123,449, Cl. 260-453.0AR.

Klaver, Petrus; and Steenhof de Jong, Jacob G., to Du Pont de Nemours, E. I., and Company. Dry spinning pack assembly. 4,123,208, Cl. 425-72.00S.

Kleinpeter, Joseph A., to Continental Oil Company. Adiabatic reactor. 4,123,448, Cl. 260-449.00M.

Kline, Frederick E.: *See—*
Cook, Francis J.; and Kline, Frederick E., 4,123,798, Cl. 365-237.000.

Klose, Peter H.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Dry process production and annotation of archival microform records from hard copy. 4,123,157, Cl. 355-43.000.

Klundt, Kurt, to Pfaff Industriemaschinen GmbH. Sewing machine having an oil filter. 4,122,789, Cl. 112-256.000.

Knetsch, Wilfried; and Petricek, Elisabeth. Device for applying pressure to a selected point of a human finger. 4,122,852, Cl. 128-303.00R.

Knight, Phillip D.; deMauriac, Richard A.; and Graham, Patricia A., to Eastman Kodak Company. Heat developable imaging materials and process. 4,123,274, Cl. 96-66.00T.

Knoll, Jozsef: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, 4,123,533, Cl. 424-251.000.

Knuppel, Helmut; Brotzmann, Karl; and Fassbinder, Hans G., to Eisenwerk-Gesellschaft Maximilianshutte mbH. Method for supplying thermal energy to steel melts. 4,123,259, Cl. 75-60.000.

Kobayashi, Akio; and Ohya, Masaki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Bonding a multi-layered structure of olefin-containing and nitrile-containing polymers and article. 4,123,576, Cl. 428-35.000.

Kobayashi, Odawara, to Fuji Photo Film Co., Ltd. Light-sensitive o-quinonediazide containing planographic printing plate. 4,123,279, Cl. 96-91.00D.

Kobayashi, Tamotsu; and Futamura, Jun, to Hokushin Electric Works, Ltd. Magnetic current meter for open channel flow measurement. 4,122,714, Cl. 73-194.0EM.

Kobe Steel, Ltd.: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.

Koch, Carl C.: *See—*
Prince, David C., Jr.; and Koch, Carl C., 4,123,196, Cl. 415-181.000.

Kochis, August J.: *See—*
Dussault, Edmund J.; Kochis, August J.; and Cross, Arthur A., 4,122,887, Cl. 160-354.000.

Kochs Adler AG: *See—*
Scholl, Hans; and Bernewasser, Horst, 4,122,785, Cl. 112-121.150.

Kock, Bruce A. Stop watch and timing device. 4,122,663, Cl. 58-74.000.

Kodama Kagaku Kohyo K. K.: *See—*
Madenokoji, Tadahide, 4,123,215, Cl. 425-388.000.

Kodama, Kenichiro: *See—*
Watanabe, Takeshi; and Kodama, Kenichiro, 4,123,477, Cl. 260-897.00C.

Koenig & Bauer Aktiengesellschaft: *See—*
Sauer, Hartmut K., 4,122,774, Cl. 101-415.100.
Weschenfelder, Otto T.; and Michalik, Horst B., 4,123,048, Cl. 270-77.000.

Koeppel, Peter: *See—*
Frei, Roland; Gutmann, Franz; Sieber, Peter; and Koeppel, Peter, 4,123,228, Cl. 422-274.000.

Koepplin, Gilbert L. Unpowered support vehicle. 4,122,901, Cl. 171-61.000.

Koerber, Barbara M.: *See—*
Freenor, Francis J., III; and Koerber, Barbara M., 4,123,255, Cl. 71-103.000.

Kofluk, Russell P.: *See—*
Sefton, Verner B.; and Kofluk, Russell P., 4,123,260, Cl. 75-117.000.

Kohler, Dale M.; Dahlstrom, Norris A.; and Taylor, David W., to Armco Steel Corporation. Post decarburization anneal for cube-on-edge oriented silicon steel. 4,123,298, Cl. 148-111.000.

Kohler, Dale M.: *See—*
Brewer, David C.; Evans, James D.; Kohler, Dale M.; and Haselkorn, Michael H., 4,123,337, Cl. 204-129.300.

Kohler, Klaus; Woditsch, Peter; and Schultz, Karl-Heinz, to Bayer Aktiengesellschaft. Oxidation of metallic iron to black oxide pigments. 4,123,501, Cl. 423-152.000.

Kohn, Gustave K.: *See—*
Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., 4,123,552, Cl. 424-311.000.

Kohn, Jean, to Baltek Corporation. Technique for converting balsa logs into panels. 4,122,878, Cl. 144-316.000.

Kohriyama, Yoshimasa, to Caterpillar Mitsubishi Ltd. Noise reducing device in undercarriage of track-type vehicle. 4,123,120, Cl. 305-41.000.

Kohrt, Carl F.: *See—*
Ciurca, Samuel, Jr.; and Kohrt, Carl F., 4,123,273, Cl. 96-66.00T.

Koht, Lowell I.; Kinsch, Michael J., Jr.; and Humphries, William H., to Raychem Corporation. Modular clip assembly for heat shrinkable material. 4,123,047, Cl. 269-238.000.

Koiwai, Yutaka: *See—*
Shichida, Hiromichi; Gamo, Gotaro; Nomura, Yoshiyuki; Hattori, Kiyoshi; and Koiwai, Yutaka, 4,123,645, Cl. 219-69.00W.

Koji, Takemori: *See—*
Osamu, Umekawa; Koji, Takemori; and Sakae, Katayama, 4,123,443, Cl. 260-347.400.

Kolesnikov, Vyacheslav D.: *See—*
Kapitanov, Nikolai N.; Kolosova, Svetlana V.; Kolesnikov, Vyacheslav D.; and Kharchenko, Vladimir P., 4,122,989, Cl. 227-108.000.

Kolosova, Svetlana V.: *See—*
Kapitanov, Nikolai N.; Kolosova, Svetlana V.; Kolesnikov, Vyacheslav D.; and Kharchenko, Vladimir P., 4,122,989, Cl. 227-108.000.

Kolt, Stanley, to Suroff, Leonard W., a part interest. Automatic ventilator. 4,123,001, Cl. 236-49.000.

Komatsu, Fumito; and Yazima, Shinkichi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Automatic stopping device for tape recorder. 4,123,015, Cl. 242-191.000.

Kondou, Akira: *See—*
Kita, Shinichiro; Hiki, Fumihiko; Shimizu, Masayuki; and Kondou, Akira, 4,123,600, Cl. 526-65.000.

Kondur, Nicholas, Jr., to LRC, Inc. Cam drive for matrix print heads and the like. 4,123,182, Cl. 400-328.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Inowa, Shigeru; Nakamura, Issei; and Furuya, Tutomu, 4,123,156, Cl. 355-3.0SC.
Kimura, Yoshiaki; Kawai, Masanori; and Hatano, Takashi, 4,123,761, Cl. 346-140.00R.
Takahashi, Jiro; and Miyamoto, Akihiko, 4,123,330, Cl. 96-29.00D.

Kononenko, Viktor Evmenievich; Tamazina, Valentina Nikolaevna; and Ozerova, Alla Ivanovna. Method of manufacturing an iron electrode for alkaline accumulators. 4,123,568, Cl. 427-126.000.

Koppers Company, Inc.: *See—*
Emery, William G., 4,123,334, Cl. 202-262.000.

Korlatzki, Rudi; and Schuhmacher, Gunter, to Naturin-Werk Becker & Do. Polyurethanes and food casing made therefrom particularly by extrusion and stretching. 4,123,589, Cl. 428-425.000.

Korn, Volker: *See—*
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, 4,122,839, Cl. 128-2.080.

Korner, Paul: *See*—
Grittner, Heinz; Giese, Ralph; and Korner, Paul, 4,122,583, Cl. 24-208.00A.
Kornowski, Henri; Roques, Bernard; Oberlin, Robert; and Jondet, Andre, to Merrell Toraude S. A. Acetylsalicylic acid derivatives. 4,123,544, Cl. 424-274.000.
Korsak, Kazimierz. VTOL launching and retrieval systems. 4,123,020, Cl. 244-116.000.
Kosaka, Tosihisa: *See*—
Inoue, Komei; and Kosaka, Tosihisa, 4,122,935, Cl. 194-32.000.
Koschmieder, Hartmut: *See*—
Grimm, Robert; and Koschmieder, Hartmut, 4,122,589, Cl. 29-148.40C.
Koskinen, Ensio, to Enso-Gutzeit Osakeyhtio. Disk filter. 4,123,363, Cl. 210-331.000.
Koss, George A., to Ford Motor Company. Gas table. 4,123,113, Cl. 302-2.00R.
Kothmann, Richard E.: *See*—
Cushing, George B.; and Kothmann, Richard E., 4,123,618, Cl. 174-11.0BH.
Kotsakis, Mike D.; and Schwarz, Albert J., to Imperial-Eastman Corporation. Push-pull fitting. 4,123,090, Cl. 285-39.000.
Kovar, Paul J. Joist bridging member. 4,122,647, Cl. 52-695.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Weber, Robert; Katscher, Erich; and Schabert, Hans-Peter, 4,123,323, Cl. 176-30.000.
Krall, Thomas J., to Owens-Illinois, Inc. Blow pin assembly with venting means. 4,123,218, Cl. 425-535.000.
Kramann, Bernhard; and Tammen, Heinrich, to Byk Gulden Lomberg Chemische Fabrik - GmbH. Catheter. 4,122,591, Cl. 29-157.00R.
Krch, Karel: *See*—
Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, 4,123,114, Cl. 302-53.000.
Krech, Hans: *See*—
Hartmann, Ernst G.; Krech, Hans; and Meir, Franz, 4,123,749, Cl. 340-572.000.
Kreikebaum, Gerhard: *See*—
Carlson, Thomas B.; and Kreikebaum, Gerhard, 4,122,719, Cl. 73-342.000.
Krenowicz, Robert A.: *See*—
Miller, Edsel L.; and Krenowicz, Robert A., 4,123,369, Cl. 252-32.70E.
Kress Corporation: *See*—
Kress, Edward S., 4,122,961, Cl. 214-313.000.
Kress, Edward S., to Kress Corporation. Pot handlling trailer with compound action. 4,122,961, Cl. 214-313.000.
Krippner, Kenneth E.; and Zacher, Albert R., Jr., to Artronix Inc. X-ray detector. 4,123,657, Cl. 250-385.000.
Kruger, Bernard M., to Herman, Arnold. Microfilm-unit and magnifying-glass locket. 4,122,619, Cl. 40-365.000.
Kruger, Johann, to U.S. Philips Corporation. Magnetic information carrier with optical servo tracks and apparatus for reading and writing the same. 4,123,788, Cl. 360-77.000.
Kruger, Johann: *See*—
Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, 4,123,147, Cl. 350-285.000.
Krupey, John; and Welchner, Ewald F., to American Home Products Corporation. Purification of glycoproteins and immunization therewith. 4,123,343, Cl. 204-180.00G.
Krzeszowski, Thaddee, to Societe Anonyme dite: Weber et Broutin. Method of heating for connecting a plate element to a support by means of a thermofusible glue. 4,123,305, Cl. 156-71.000.
Kubiatowicz, James F., to Custom Concepts, Incorporated. Underwater toy operated by chemically produced gas bubbles. 4,122,627, Cl. 46-92.000.
Kubushiki Kaisha Kokugo: *See*—
Sato, Shunichi; Kawasaki, Midori; and Kunii, Mamoru, 4,123,123, Cl. 312-1.000.
Kuhlmann, Wolf; Rumpp, Gerhard; and Busler, Albert, to Hilti Aktiengesellschaft. Expansion anchor assembly including an interconnecting device. 4,122,753, Cl. 85-74.000.
Kumisi Chemical Industry Co., Ltd.: *See*—
Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, 4,123,554, Cl. 424-324.000.
Kumoi, Sadakatsu: *See*—
Mabuchi, Shunsuke; Tsuzuki, Kenji; and Kumoi, Sadakatsu, 4,123,616, Cl. 568-861.000.
Kunii, Mamoru: *See*—
Sato, Shunichi; Kawasaki, Midori; and Kunii, Mamoru, 4,123,123, Cl. 312-1.000.
Kupelian, Robert H., to American Cyanamid Company. Inhibiting plant bud growth with substituted 2,6-di-nitroanilines. 4,123,250, Cl. 71-78.000.
Kurashiki Boseki Kabushiki Kaisha: *See*—
Kawamura, Masatada; and Yamane, Hiroyuki, 4,122,797, Cl. 116-137.00A. .
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Kobayashi, Akio; and Ohya, Masaki, 4,123,576, Cl. 428-35.000.
Kurosaki, Shiro: *See*—
Nakahara, Tsuneo; Hoshikawa, Masao; Shiraishi, Satoshi; Kurosaki, Shiro; and Fujiwara, Kunio, 4,123,483, Cl. 264-1.000.
Kusama, Haruya: *See*—
Minemura, Hajime; Kusama, Haruya; and Sato, Shoichi, 4,123,066, Cl. 274-10.00C.
Kuzarov, Encho J., to Warn Industries, Inc. Winch mounting apparatus. 4,123,040, Cl. 254-166.000.
Kyo, Kayomon; Asai, Yasuhiko; and Tokumitsu, Shinichi, to Unitika Ltd. Aromatic copolyester composition containing phosphorus compounds. 4,123,420, Cl. 528-127.000.
Kyoto Ceramic Kabushiki Kaisha: *See*—
Hirabayashi, Masaya; Kawahara, Haruyuki; and Taniguchi, Yoshio, 4,122,605, Cl. 32-10.00A.
Laauwe, Robert H. Squeeze bottle containing a liquid product and operative whether upright or inverted. 4,122,979, Cl. 222-193.000.
Lacklison, David E.: *See*—
Pearson, Ronald F.; Lacklison, David E.; Scott, George B.; and Palfreeman, John S., 4,123,783, Cl. 358-230.000.
LaConti, Anthony B.; Torkildsen, Robert A.; and Jones, Robert C., to General Electric Company. Potentiostated, self-humidifying, solid polymer electrolyte carbon monoxide dosimeter. 4,123,700, Cl. 324-29.000.
Ladeur, Bernhard H.: *See*—
Port, Morton I.; Nebe, Juergen; and Ladeur, Bernhard H., 4,123,577, Cl. 428-95.000.
La France, Donald S.: *See*—
Armstrong, Warren E.; La France, Donald S.; and Voge, Hervey H., 4,122,671, Cl. 60-218.000.
Laird, Dale E., to Industrial Electrical Control Corporation. Reflective laser line generator. 4,123,148, Cl. 350-293.000.
Lamberti, Vincent: *See*—
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,123,458, Cl. 562-595.000.
Gutierrez, Eddie N.; and Lamberti, Vincent, 4,123,459, Cl. 562-595.000.
Lampert, Ernst; and Mahner, Helmut, to Siemens Aktiengesellschaft. SSMA receiver with synchronous demodulation and variable gain control. 4,123,718, Cl. 325-474.000.
Lancto, Donald C.; and Shuck, Robert E., to International Business Machines Corporation. Identity verification method and apparatus. 4,123,747, Cl. 340-149.00A.
Landen, Goran: *See*—
Engman, Thomas; Ericsson, Dan; and Landen, Goran, 4,122,741, Cl. 83-834.000.
Landis, Phillip S.: *See*—
Bridger, Robert F.; and Landis, Phillip S., 4,123,372, Cl. 252-48.200.
Landler, Paul F.: *See*—
Joshi, Madhukar L.; Landler, Paul F.; and Silverman, Ronald, 4,123,300, Cl. 148-187.000.
Landry, Archie C.; and Daswick, Alexander C., to Daswick, Alexander C. Adjustable reclining chair having three-point suspension, and method. 4,123,102, Cl. 297-270.000.
Landry, Robert G., to Long Mile Rubber Company. Method and system for retreading tires utilizing RF energy. 4,123,306, Cl. 156-96.000.
Lane Container Company: *See*—
Holley, Ronnie E., 4,122,946, Cl. 206-523.000.
Lange, Fritz-Walter; Jacobi, Haireddin; and Muller, Jens, to Chemisches Laboratorium Fritz-Walter Lange GmbH & Co KG. (2-Oxo-pyrrolidines)-acetic hydrazides. 4,123,548, Cl. 424-274.000.
Lange, Gerhard; and Peche, Gerhard, to Siemens Aktiengesellschaft. Cold cathode gas-discharge tube. 4,123,682, Cl. 313-54.000.
Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Load transfer mechanism for packaging machine. 4,122,939, Cl. 198-482.000.
Lapp, Roger H.; and Schneider, Jacob D., to United States of America, Navy. Radar sector scan reversal apparatus. 4,123,757, Cl. 343-766.000.
Laramore, William D. Automatic bakery product dusting flour recycling system. 4,123,213, Cl. 425-104.000.
Large, George B.; and Pitt, Leland S., to Stauffer Chemical Company. Thionophosphate insecticide activators. 4,123,526, Cl. 424-200.000.
Larsen, Ronald L., to Conwed Corporation. Process for manufacturing high strand count plastic net. 4,123,491, Cl. 264-167.000.
Laser Industries Ltd.: *See*—
Yachin, Ami; and Gozhansky, Baruch, 4,123,143, Cl. 350-171.000.
Lasher, Edward A., to Whittaker Corporation. Water-based coatings. 4,123,404, Cl. 260-29.40R.
Laskaris, Evangelos T.; Gamble, Bruce B.; and Hatch, Burton D., to General Electric Company. Self-regulating transport mechanism for super-conductive rotor refrigerant. 4,123,677, Cl. 310-52.000.
Laubie, Michel: *See*—
Vincent, Michel; Remond, Georges; Laubie, Michel; and Poignant, Jean-Claude, 4,123,531, Cl. 424-250.000.
Laucks, Howard H.: *See*—
Pegler, Frederick E. W.; and Laucks, Howard H., 4,122,598, Cl. 29-568.000.
Laufhutte, Dieter, to Carl Still Recklinghausen, Firma. Method of keeping the circulating sprinkling water for the uptakes of coke ovens clean. 4,123,331, Cl. 201-4.000.
Lauria, Francesco: *See*—
Melloni, Piero; Della Torre, Arturo; Lauria, Francesco; Passerini, Norina; Rossi, Alessandro; and Tommasini, Raffaele, 4,123,527, Cl. 424-244.000.
Laverty, Gerald C., to Mastman, Gary J. Container top with integral stopper. 4,122,980, Cl. 222-207.000.
Lavon, Erik V., to Atlas Copco Aktiebolag. Method and device for breaking a hard compact material. 4,123,108, Cl. 299-16.000.
Lawler, Harry A.: *See*—
Coppola, John A.; Lawler, Harry A.; and McMurtry, Carl H., 4,123,286, Cl. 106-44.000.
Laws, William R.; and Winkworth, David A., to British Steel Corpora-

tion. Tube mounting means for a ceramic recuperator. 4,122,894, Cl. 165-76.000.
Lawson, David E. Molded plastic article and method of making the same. 4,123,488, Cl. 264-135.000.
Leclerc du Sablon, Bruno; and Dejoux, Andre. Electronic and kinematic contrivance for a selective recording of signals on a single tape. 4,123,787, Cl. 360-74.000.
Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, to BFG Glassgroup. Process of forming a metal or metal compound coating on a face of a glass substrate and apparatus suitable for use in forming such coating. 4,123,244, Cl. 65-60.00C.
Lectromelt Corporation: *See—*
Wynne, Peter J., 4,123,617, Cl. 13-10.000.
Ledebuhr, Richard L.; Hansen, Clarence M.; and Patterson, Richard J., to Michigan State University. Fruit and vegetable decapping machine. 4,122,766, Cl. 99-640.000.
Lee, Edward, to Solv-X Inventions Ltd. Pump support and fluid deflector assembly for parts washing machines. 4,122,861, Cl. 134-109.000.
Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether resin compositions of reduced melt viscosity. 4,123,410, Cl. 260-30.60R.
Lehnhart, Dieter, to Glyco-Metall-Werke Daelen & Loos GmbH. Collar sleeves and process and tool for the manufacture thereof. 4,122,701, Cl. 72-354.000.
Leibrock, Kurt, to Saarbergwerke Aktiengesellschaft. Coal compacting apparatus. 4,123,216, Cl. 425-431.000.
Leichnitz, Kurt: *See—*
Heim, Ulrich; Leichnitz, Kurt; and Wiesner, Peter, 4,123,227, Cl. 23-232.00R.
Leiendecker, Donald M.: *See—*
Guthrie, David B.; and Leiendecker, Donald M., 4,123,231, Cl. 44-51.000.
Leimgruber, Willy; and Valentine, Donald H., Jr., to Hoffmann-La Roche Inc. Process for the preparation of aldehydes. 4,123,464, Cl. 260-601.00R.
Leins, Alfred, to Eberspacher, J. Internal combustion engine with afterburning and catalytic reaction in a supercharger turbine casing. 4,122,673, Cl. 60-274.000.
Leister, Norman A.; and Neuman, Andrew, to Rohm and Haas Company. Alkaline earth metal salt dispersions in acrylic polymers. 4,123,368, Cl. 252-25.000.
Leisure Products, Inc.: *See—*
Moeser, Denis S., 4,122,571, Cl. 9-7.000.
Lemelson, Jerome H. Method for forming hollow shells by rotational casting and winding thereon. 4,123,307, Cl. 156-172.000.
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Leney, David E.; Stuart, Robert W.; and Anderegg, John S., to Dynamics Research Corporation. Signal processor for position encoder. 4,123,750, Cl. 340-347.00P.
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Warner, Gregory L.; and Leng, Douglas E., 4,123,403, Cl. 260-29.2EP.
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Leonard, Loren W. Body surface contour deformation. 4,122,837, Cl. 128-2.00S.
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Lepor, Meyer, to United States of America, Navy. Dry cooled jet aircraft runup noise suppression system. 4,122,912, Cl. 181-218.000.
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Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, to Saint-Gobain Industries. Apparatus for forming fibers by toration. 4,123,243, Cl. 65-16.000.
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Gutierrez, Eddie N.; and Lamberti, Vincent, 4,123,458, Cl. 562-595.000.
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Levizzari, Giannetto; and Ruspa, Giacomo, to Fiat Societa per Azioni. Method and apparatus for testing the quality of cast iron pieces especially spheroidal cast-iron pieces. 4,122,723, Cl. 73-579.000.
Levy, Harold. Device for drying drip dry apparel that is easily adjusted. 4,123,024, Cl. 248-214.000.
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Lewis, Arthur F.: *See—*
Townsend, Leroy B.; Lewis, Arthur F.; and Roti Roti, Linda W., 4,123,524, Cl. 424-180.000.
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Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, 4,123,550, Cl. 424-275.000.
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Runkel, Manfred A.; and Licha, Joseph, 4,122,759, Cl. 92-168.000.
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Kammel, Roland; and Lieber, Hans-Wilhelm, 4,123,340, Cl. 204-149.000.
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., to International Flavors & Fragrances Inc. Substituted-norbornane perfume compositions. 4,123,393, Cl. 252-522.000.
Lilley, John, to Lucas Industries Limited. Lamp reflectors. 4,123,793, Cl. 362-350.000.
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Verge, John P.; and Jamieson, William B., 4,123,529, Cl. 424-250.000.
Lin, Chung-Yuan; Stuber, Fred A.; and Ulrich, Henri, to Upjohn Company, The. Process for nitrating aromatic hydrocarbons. 4,123,466, Cl. 260-645.000.
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Follert. Hans G.; Linde, Klaus; and Jutte, Hans, 4,122,683, Cl. 405-142.000.
Link, Christoph; and Trondle, Robert, to Escher Wyss GmbH. Removable head box for a paper making machine. 4,123,321, Cl. 162-272.000.
Linkenheimer, Wayne H.: *See—*
O'Connor, Jeremiah J.; Pilote, Raymond R.; and Linkenheimer, Wayne H., 4,123,522, Cl. 424-116.000.
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Dean, Lura C., Jr.; Boswell, Gary T.; Winkelman, Wayne; and Little, Frank S., 4,123,795, Cl. 364-200.000.
Litton Systems, Inc.: *See—*
Sanders, Virgil E., 4,123,162, Cl. 356-106.0LR.
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Cooper, Glenn D.; and Litz, Donald C., 4,123,676, Cl. 310-52.000.
Locke, Lillian. Refrigerator apparatus. 4,123,130, Cl. 312-285.000.
Loesch, Stanley B., to Halliburton Company. Retaining clip for flow meter. 4,122,717, Cl. 73-231.00R.
Loew, Peter, to Ciba-Geigy Corporation. Process for the dyeing or printing of polyacrylonitrile material. 4,123,222, Cl. 8-39.00A.
Loewrigkeit, Peter: *See—*
Cowell, Richard D.; Loewrigkeit, Peter; Rosenblatt, William; and Bluestein, Claire, 4,123,421, Cl. 528-65.000.
Loew's Theatres, Inc.: *See—*
Slater, John R., 4,122,954, Cl. 211-133.000.
Logsdon, Cletus R. Tool for removing dents from sheet metal. 4,122,699, Cl. 72-325.000.
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Landry, Robert G., 4,123,306, Cl. 156-96.000.
Lonza, Ltd: *See—*
Jackson, Barry; and Zinsstag, Christoph, 4,123,460, Cl. 260-544.00D.
Losinski, Edward: *See—*
Frey, Fred J.; Hynek, Stanley; and Losinski, Edward, 4,123,105, Cl. 297-451.000.
Lott, Donald L.; Schockelt, Guenter G.; and Worrix, Matthew L., to Siemens-Allis, Inc. High voltage air disconnect switch incorporating a puffer-type load break switch. 4,123,637, Cl. 200-148.00A.
Lowe, Wallace A.; and Robarts, Donald E. Solar energy collector. 4,122,829, Cl. 126-271.000.
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Lowery, James V.; Lowery, Charles L.; Lowery, Vernon L.; and Lowery, Jimmy R., 4,122,975, Cl. 221-173.000.
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Lowery, James V.; Lowery, Charles L.; Lowery, Vernon L.; and Lowery, Jimmy R., 4,122,975, Cl. 221-173.000.
Lowrie, Brian W., to Rolls-Royce Limited. Duct linings. 4,122,672, Cl. 60-226.00R.
LRC, Inc.: *See—*
Kondur, Nicholas, Jr., 4,123,182, Cl. 400-328.000.
Lubrizol Corporation, The: *See—*
Meinhardt, Norman A., 4,123,370, Cl. 252-32.70E.
Lucas Industries Limited: *See—*
Davidson, Charles P. D.; and Philips, Edward G., 4,122,907, Cl. 180-33.00C.
Lilley, John, 4,123,793, Cl. 362-350.000.
Maden, Kenneth H., 4,123,241, Cl. 55-442.000.
Seilly, Alec H., 4,123,691, Cl. 318-119.000.
Ludwig Riedhammer GmbH & Co. K.G.: *See—*
Petzi, Fritz, 4,123,044, Cl. 266-255.000.
LuK Lamellen und Kupplungsbau GmbH: *See—*
Maucher, Paul; and Maucher, Edmund, 4,122,929, Cl. 192-70.180.
Maucher, Paul, 4,122,931, Cl. 192-106.200.
Luke, James H.: *See—*
Dammel, Howard W.; Frantz, Robert M.; Luke, James H.; and Skrzypczyk, William G., 4,123,642, Cl. 219-10.590.
Lunycz, Alexander N. Electrical meter connecting and disconnecting device. 4,122,599, Cl. 29-758.000.

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Lyons, James E., to Sun Ventures, Inc. Novel homogeneous transition-metal catalyzed geometric isomerization of cyclic epoxy alcohols. 4,123,445, Cl. 260-348.120.

M & W Gear Company: *See—*
Neubert, Frederic B.; and Coldren, Kenneth M., 4,122,932, Cl. 193-5.000.

Maa, Peter S., to Exxon Research & Engineering Co. Coal liquefaction process. 4,123,347, Cl. 208-8.000.

Mabuchi, Shunsuke; Tsuzuki, Kenji; and Kumoi, Sadakatsu, to Toyo Soda Manufacturing Co., Ltd. Process for hydrogenation of organic peroxide. 4,123,616, Cl. 568-861.000.

Mac Engineering & Equipment Company, Inc.: *See—*
McAlpine, Charles H., 4,123,311, Cl. 156-443.000.

Macek, Ladislav: *See—*
Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, 4,123,114, Cl. 302-53.000.

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Ferlise, Louis; and Mackey, Sherman E., 4,123,189, Cl. 408-21.000.

MacLeod, Norman C., to Technology Development Corporation. Protective cover for sound transducers located in face masks of divers. 4,123,622, Cl. 179-1.0UW.

Maden, Kenneth H., to Lucas Industries Limited. Filter. 4,123,241, Cl. 55-442.000.

Madenokoji, Tadahide, to Kodama Kagaku Kohyo K. K. Vacuum forming apparatus. 4,123,215, Cl. 425-388.000.

Madlener, Bruno A., to Etablissement Dentaire Ivoclar. Device for securing a mixing capsule for dental preparations. 4,123,046, Cl. 269-228.000.

Maffre, Michel: *See—*
Bonnefon, Alain; Coupard, Alain; and Maffre, Michel, 4,123,476, Cl. 260-897.00A.

Magazian, Harry: *See—*
Gabrielson, Alan L.; and Magazian, Harry, 4,123,122, Cl. 308-238.000.

Magnaflux Corporation: *See—*
Strauts, Eric J.; and Flaherty, John J., 4,123,797, Cl. 365-118.000.

Magnavox Company, The: *See—*
Borg, Arthur N., 4,123,716, Cl. 325-464.000.
Bugni, Anthony R., 4,123,775, Cl. 358-10.000.

Magnotta, Vincent L.: *See—*
Gates, Bruce C.; Magnotta, Vincent L.; and Schuit, George C. A., 4,123,379, Cl. 252-184.000.

Maguire, Edward J., Jr.; and Staab, Robert A., to Procter & Gamble Company, The. Compositions containing nonionic surfactant and sulfonated aromatic compatibilizing agent. 4,123,395, Cl. 252-559.000.

Mahan, John E.: *See—*
Fahey, Darryl R.; and Mahan, John E., 4,123,447, Cl. 260-439.00R.

Mahdjuri, Faramarz, to U.S. Philips Corporation. Solar collector comprising an elongate absorber in an evacuated transparent tube. 4,122,831, Cl. 126-271.000.

Mahner, Helmut: *See—*
Lampert, Ernst; and Mahner, Helmut, 4,123,718, Cl. 325-474.000.

Maier, Alfred E.; and Hill, Robert H., to Westinghouse Electric Corp. Circuit breaker with improved latch mechanism. 4,123,734, Cl. 335-9.000.

Maier, Lawrence C., to Simmonds Precision Products, Inc. Capacitive proximity sensors. 4,122,708, Cl. 73-136.00A.

Maiorano, Giovanni: *See—*
Bertolini, Natale; Divo, Claudio; Maris, Petri; and Maiorano, Giovanni, 4,123,471, Cl. 260-683.15C.

Maixner, Uwe; and Milferstadt, Dieter, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Arrangement for preventing the alteration of the primary beam by unwanted particles, such as sputter products, charged ions and electrons and their secondary processes. 4,123,655, Cl. 250-305.000.

Malhotra, Satish C., to Du Pont de Nemours, E. I., and Company. Deagglomeration process. 4,123,606, Cl. 528-499.000.

Malinovski, Yordan P.; Mednikarov, Borislav D.; and Assa, Jakob J., to Zlafop pri BAN. Silver halide vapor deposition method. 4,123,280, Cl. 96-94.0BF.

Maltby, Jack, to Davy-Loewy Limited. Shear. 4,122,740, Cl. 83-646.000.

Malton Electric Company: *See—*
Bozich, Robert, 4,122,972, Cl. 220-331.000.

Mamo, Anthony C. Archery bow and method of advantageously altering bow characteristics. 4,122,821, Cl. 124-23.00R.

Mandler, Walter; Edwards, Garry; and Wagner, Erich, to Ernst Leitz Wetzlar GmbH. Four-member gauss objective. 4,123,144, Cl. 350-222.000.

Mandrin, Charles, to Sulzer Brothers Limited. Apparatus and method for manufacturing deuterium enriched water. 4,123,508, Cl. 423-580.000.

Mangarell, Edward M. Self-contained vivarium habitat. 4,122,800, Cl. 119-5.000.

Mangin, Pierre M.: *See—*
Avaro, Michel M.; and Mangin, Pierre M., 4,123,386, Cl. 252-429.00B.

Mannino, Albert A. Fuel mixture charge device. 4,123,233, Cl. 48-180.00C.

Mansouri, Hosein, to Rexnord Inc. Pressurized seal such as for drum screens. 4,123,362, Cl. 210-232.000.

Marangoni, Allen H. Window shade tie-down systems. 4,122,886, Cl. 160-269.000.

Marathon Manufacturing Company: *See—*
Marotto, Anthony F., 4,122,885, Cl. 160-176.00R.

Marcatili, Enrique A. J., to Bell Telephone Laboratories, Incorporated. Optical fiber arrangement for splicing fibers secured to ribbonlike tape. 4,123,137, Cl. 350-96.210.

Marchal, Paul; and Alvarez, Pierre, to Air Industrie. Apparatus for the continuous thermal treatment of a product moving through an enclosed space. 4,122,611, Cl. 34-73.000.

Marine Moisture Control Company, Inc.: *See—*
Gravert, William H., 4,123,753, Cl. 340-621.000.

Marinelli, Donald P., to RCA Corporation. Method for depositing epitaxial semiconductor from the liquid phase. 4,123,302, Cl. 148-171.000.

Maris, Petri: *See—*
Bertolini, Natale; Divo, Claudio; Maris, Petri; and Maiorano, Giovanni, 4,123,471, Cl. 260-683.15C.

Mark, Victor; and Wilson, Phillip S., to General Electric Company. Polycarbonate composition containing urethane plasticizer. 4,123,413, Cl. 260-32.6NR.

Markert, Herman R.: *See—*
Rowe, E. Riley; Fletcher, Wade; Markert, Herman R.; and Grady, Dwight D., 4,122,790, Cl. 113-120.00R.

Marklund, Per A.: *See—*
Westin, Per-Olov; and Marklund, Per A., 4,122,761, Cl. 98-33.00R.

Marlow, Glenn. Mitering device for wood and metal picture frames. 4,122,739, Cl. 83-421.000.

Marotto, Anthony F., to Marathon Manufacturing Company. Venetian blind tilter clutch. 4,122,885, Cl. 160-176.00R.

Marschman, Loren H. Lint filter assembly. 4,123,361, Cl. 210-232.000.

Marsh, William R.: *See—*
Behnke, Walter E.; Marsh, William R.; and Haskell, Theodore H., 4,123,609, Cl. 536-27.000.

Martin Marietta Corporation: *See—*
Ambemtson, David S., 4,123,019, Cl. 244-3.200.
Karki, Kenneth A., 4,123,591, Cl. 428-454.000.
Lewis, George R.; and Fernandez, Allen, 4,123,017, Cl. 244-3.160.

Martineau, Ronald A.: *See—*
Nowlin, Thomas E.; and Martineau, Ronald A., 4,123,308, Cl. 156-272.000.

Maruzen Oil Co., Ltd.: *See—*
Hori, Takashi; and Hayashida, Suetou, 4,123,371, Cl. 252-42.700.

Maschinenfabrik Johann Fischer: *See—*
Fischer, Stefan; Wollschlager, Dieter; Scharrenbroich, Helmut; and Fischer, Rainer, 4,123,217, Cl. 425-525.000.

Masco Corporation of Indiana: *See—*
Fathauer, George H., 4,123,715, Cl. 325-464.000.

Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I. Induction-type meter for measuring mechanical quantities. 4,123,735, Cl. 336-30.000.

Mashigan, Charles, to American Motors Corporation. Closure for truck bed. 4,123,099, Cl. 296-10.000.

Maso-Therm Corporation: *See—*
Piazza, Matthew R., 4,123,212, Cl. 425-82.100.

Massa, Frank, to Donald P. Massa & Fred M. Dellorfano, Jr. Trustees of The Stonleigh Trust u/d/t. Process for applying electrodes to the surfaces of electroacoustic transducer elements such as ceramic discs. 4,123,567, Cl. 427-123.000.

Mastman, Gary J.: *See—*
Laverty, Gerald C., 4,122,980, Cl. 222-207.000.

Masuda, Yoshinori: *See—*
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Kimoto, Kyoji; and Masuda, Yoshinori, 4,123,336, Cl. 204-98.000.

Matburn (Holdings) Limited: *See—*
Blackett, John H., 4,122,854, Cl. 128-303.130.

Matlock, Wallace M., to TRW Inc. Internal combustion valve having an iron based hard-facing alloy contact surface. 4,122,817, Cl. 123-188.0AA.

Matsukata, Kosuke. Predetermined index gauge for locating a selected record band on a gramaphone record. 4,123,064, Cl. 274-1.00R.

Matsumiya, James A.: *See—*
Fisher, Peter M.; and Matsumiya, James A., 4,122,882, Cl. 152-381.2WC.

Matsumoto, Seiichi: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.

Matsumoto, Yoshihiro, to Tokyo Shibaura Electric Co., Limited. Multicomputer system. 4,123,794, Cl. 364-101.000.

Matsumura, Kazuhiro: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,123,387, Cl. 252-429.00B.

Matsushita Electric Industrial Co., Ltd.: *See—*
Oda, Fujio, 4,123,647, Cl. 219-216.000.

Maucher, Edmund: *See—*
Maucher, Paul; and Maucher, Edmund, 4,122,929, Cl. 192-70.180.

Maucher, Paul; and Maucher, Edmund, to LuK Lamellen und Kupplungsbau GmbH. Friction clutch, especially for motor vehicles. 4,122,929, Cl. 192-70.180.

Maucher, Paul, to LuK Lamellen und Kupplungsbau GmbH. Clutch disk assembly. 4,122,931, Cl. 192-106.200.

May, Randall L. Adjustable pitch drum. 4,122,748, Cl. 84-411.00A.

Mayer, Sigmund: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,123,385, Cl. 252-414.000.

Mazzei, Angelo L. Mixer-injector. 4,123,800, Cl. 366-150.000.

McAlpine, Charles H., to Mac Engineering & Equipment Company, Inc. Machine for wrapping battery plates. 4,123,311, Cl. 156-443.000.

McCaldin, James O.; and Best, John S., to California Institute of Technology. Mercury chalcogenide contact for semiconductor devices. 4,123,295, Cl. 148-33.000.

McCaskey, Harold O., Jr., to Westinghouse Electric Corp. Resin coated substrate using a short-set, high-flow melamine-formaldehyde impregnating resin. 4,123,579, Cl. 428-264.000.

McClain, Robert Woodrow, to Glitsch, Inc. Reactor distribution duct. 4,123,008, Cl. 239-568.000.

McConnell, David P.; and Tully, Louis E., to McConnell, David P. Fluid operated engine. 4,122,757, Cl. 91-506.000.

McCullough, Robert W., to Milliken Research Corporation. Yarn tension control. 4,123,014, Cl. 242-152.100.

McDonald, W. B. Paper carrier for roll paper machines. 4,122,650, Cl. 53-389.000.

McElliott, Steve I. Pay telephone alarm and audit system. 4,123,623, Cl. 179-6.30R.

McGinley, Thomas F. Method of weaving and apparatus therefor. 4,122,871, Cl. 139-11.000.

McGinley, Thomas F. Method and apparatus for inserting weft in a warp-wave weaving system. 4,122,872, Cl. 139-11.000.

McGraw-Edison Company: *See—*
Huber, William J., 4,123,738, Cl. 337-159.000.

McKee, Thomas M. Refrigeration system with low energy defrost. 4,122,687, Cl. 62-156.000.

McMurtry, Carl H.: *See—*
Coppola, John A.; Lawler, Harry A.; and McMurtry, Carl H., 4,123,286, Cl. 106-44.000.

McNamara, Michael M.; Mowe, Wayne T.; and Walker, Darwyn E., to Monsanto Company. Nylon 66 spinning process. 4,123,492, Cl. 264-210.00F.

McNeil Laboratories, Incorporated: *See—*
Umen, Michael J., 4,123,538, Cl. 424-267.000.

McReynolds, Marshall B.; and VanTilbury, Jack D., to Traffic Engineers Supply Corporation (TESCO). Method and means for determining optimum average cycle lengths. 4,122,994, Cl. 235-89.00R.

McVean, Michael T.: *See—*
Bowen, Leon O., Jr.; and McVean, Michael T., 4,122,835, Cl. 126-299.00D.

Mead Corporation, The: *See—*
Hou, Shou L., 4,123,760, Cl. 346-75.000.

Mednikarov, Borislav D.: *See—*
Malinovski, Yordan P.; Mednikarov, Borislav D.; and Assa, Jakob J., 4,123,280, Cl. 96-94.0BF.

Medtronic, Inc.: *See—*
Stasz, Peter; and Patten, Floyd R., 4,122,713, Cl. 73-194.00A.

Meeker, Paul: *See—*
Bevington, John F.; Savidge, Michael; and Meeker, Paul, 4,122,576, Cl. 15-49.00R.

Mego Corp.: *See—*
Wexler, Howard; and Reiner, Lawrence L., 4,123,062, Cl. 273-248.000.

Mehta, Nariman B.; and Brieaddy, Lawrence E., to Burroughs Wellcome Co. Sulfide compounds and methods and compositions for treating depression. 4,123,555, Cl. 424-330.000.

Meier, Ernst: *See—*
Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.

Meijer, Peter J. N.: *See—*
Geurts, Leonardus H.; and Meijer, Peter J. N., 4,123,438, Cl. 260-326.5FN.

Meinhardt, Norman A., to Lubrizol Corporation, The. Preparation and use of basic metal salt compositions of phosphorus-containing acids. 4,123,370, Cl. 252-32.70E.

Meir, Franz: *See—*
Hartmann, Ernst G.; Krech, Hans; and Meir, Franz, 4,123,749, Cl. 340-572.000.

Melillo, David G.: *See—*
Tull, Roger J.; and Melillo, David G., 4,123,457, Cl. 562-466.000.

Meller, Ian V. Course to wind guidance device. 4,122,710, Cl. 73-178.00R.

Melloni, Piero; Della Torre, Arturo; Lauria, Francesco; Passerini, Norina; Rossi, Alessandro; and Tommasini, Raffaele, to Carlo Erba, S.p.A. N-tricyclic derivatives of azetidine and process for their preparation. 4,123,527, Cl. 424-244.000.

Memmhardt, Dieter: *See—*
Renz, Udo D.; and Memmhardt, Dieter, 4,123,111, Cl. 301-37.0TP.

Menown, Hugh; and Wheldon, Robert J., to English Electric Valve Company Limited. Thyratrons. 4,123,684, Cl. 313-205.000.

Merck & Co., Inc.: *See—*
Cama, Lovji D.; and Christensen, Burton G., 4,123,528, Cl. 424-248.520.
Christensen, Burton G.; and Walton, Edward, 4,123,547, Cl. 424-274.000.
DiNinno, Frank P., 4,123,539, Cl. 424-270.000.
Hagopian, Arpi; Carlo, Dennis J.; and Stoudt, Thomas H., 4,123,520, Cl. 424-92.000.
Morse, Lewis D.; Walker, William G.; and Hammes, Paul A., 4,123,382, Cl. 252-316.000.
Smith, Robert L.; Stokker, Gerald E.; and Gragoe, Edward J., Jr., 4,123,537, Cl. 424-263.000.
Tull, Roger J.; and Melillo, David G., 4,123,457, Cl. 562-466.000.

Merilainen, Heikki; and Strom, Ulf J. G., to A. Ahlstrom Osakeyhtio. Device for measuring the width of timber. 4,123,169, Cl. 356-167.000.

Merrell Toraude S. A.: *See—*
Kornowski, Henri; Roques, Bernard; Oberlin, Robert; and Jondet, Andre, 4,123,544, Cl. 424-274.000.

Mersch, Roland: *See—*
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,123,247, Cl. 65-141.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Held, Manfred, 4,122,775, Cl. 102-8.000.
Weiland, Emil, 4,122,730, Cl. 74-606.00R.

Meszaros, Zoltan: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, 4,123,533, Cl. 424-251.000.

Metallgesellschaft: *See—*
Hilterhaus, Karl-Heinz; and Reuter, Franz G., 4,123,599, Cl. 521-123.000.

Metz, Paul; Schockmel, Robert; and Mersch, Roland, to Acieries Reunies de Burbach-Eich-Dudelange S.A. ARBED. Apparatus for expanding metallurgical slag. 4,123,247, Cl. 65-141.000.

Meyer, Willy: *See—*
Bohner, Beat; Dawes, Dag; and Meyer, Willy, 4,123,437, Cl. 260-308.00R.

Meyers, Franklin J., to Hughes Aircraft Company. Dual field image scanner. 4,123,134, Cl. 350-6.700.

Meyers, Gilbert D. Wheel lift. 4,123,038, Cl. 254-2.00R.

Michalik, Horst B.: *See—*
Weschenfelder, Otto T.; and Michalik, Horst B., 4,123,048, Cl. 270-77.000.

Michelet, Jacques; and Zanetta, Hugues, to Institut de Recherches de la Siderurgie Francaise. Crucible for induction heating apparatus. 4,123,045, Cl. 266-275.000.

Michigan State University: *See—*
Ledebuhr, Richard L.; Hansen, Clarence M.; and Patterson, Richard J., 4,122,766, Cl. 99-640.000.

Michio, Kawazoe. Object holding device. 4,123,026, Cl. 248-316.00E.

Microwave Associates, Inc.: *See—*
Hines, Marion E.; Stinehelfer, Harold E., Sr.; and Atchley, Dana W., Jr., 4,123,759, Cl. 343-854.000.

Middelbeek, Cornelis G., to Ballast-Nedam Groep N.V.; and Skimovex B.V. Oil-water separator. 4,123,365, Cl. 210-521.000.

Midzutani, Wataru; Nakajima, Koe; Kikuma, Toshio; Ondo, Keitaku; and JPX, to Nippon Steel Corporation. Method and apparatus for manufacturing metallic pipe. 4,122,696, Cl. 72-52.000.

Miers, Bruce W.; Proksch, Frederick D.; and Welker, Gerald H., to Caterpillar Tractor Co. Fan noise suppressor and baffle. 4,122,908, Cl. 180-68.00P.

Mikhael, Wasfy B., to Northern Telecom Limited. Symmetrical polyphase network. 4,123,712, Cl. 325-137.000.

Mikino, Hiroshi: *See—*
Okikawa, Susumu; Yukawa, Osamu; Mikino, Hiroshi; and Nonaka, Yoshio, 4,123,293, Cl. 148-11.50C.

Mikite, Gyula: *See—*
Levai, Laszlo; and Mikite, Gyula, 4,123,615, Cl. 568-712.000.

Mikiver, Lembit: *See—*
Jonsson, Nils A.; Mikiver, Lembit; and Moses, Pinchas, 4,123,543, Cl. 424-274.000.

Milette, Henri, to Societe Chimique des Charbonnages. Method of manufacturing reinforced phenol resin articles, and products thus obtained. 4,123,414, Cl. 260-38.000.

Milferstadt, Dieter: *See—*
Maixner, Uwe; and Milferstadt, Dieter, 4,123,655, Cl. 250-305.000.

Miller, Arthur F.: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,123,453, Cl. 260-465.300.

Miller, Cecil H.: *See—*
Benge, Robert J.; and Miller, Cecil H., 4,123,303, Cl. 149-17.000.

Miller, Edsel L.; and Krenowicz, Robert A., to Continental Oil Company. Lubricating oil composition. 4,123,369, Cl. 252-32.70E.

Miller, Helmut, to Escher Wyss Limited. Rim-type hydroelectric machine. 4,123,666, Cl. 290-52.000.

Miller, Hugo S. Combined internal combustion and steam engine. 4,122,803, Cl. 123-25.00P.

Miller, Robert F., to Modine Manufacturing Company. Method of starting a hot air furnace. 4,123,000, Cl. 236-11.000.

Milliken Research Corporation: *See—*
McCullough, Robert W., 4,123,014, Cl. 242-152.100.

Mills, Peter M., to Titan Proform Company Limited. Split wheel safety feature. 4,123,112, Cl. 301-35.0BJ.

Minamizono, Tsugikuma, to Kabushiki Kaisha Mitachi Onkyo Seisakusho. Stylus vibrating mechanism in pickup cartridge. 4,123,067, Cl. 274-37.000.

Minemura, Hajime; Kusama, Haruya; and Sato, Shoichi, to Minemura, Hajime. Device for automatically turning discs from side to side. 4,123,066, Cl. 274-10.00C.

Minnesota Mining and Manufacturing Company: *See—*
Dorer, Gary L., 4,123,267, Cl. 96-1.0PC.
Franer, Victor R., 4,123,580, Cl. 428-304.000.
Nelson, Norman E., 4,122,985, Cl. 226-181.000.

Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., 4,123,309, Cl. 156-234.000.
Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., 4,123,578, Cl. 428-206.000.
Winslow, John M., 4,123,282, Cl. 96-114.100.

Minolta Camera Kabushiki Kaisha: *See—*
Takeuchi, Koji; and Inagaki, Syotaro, 4,122,981, Cl. 222-231.000.

Minsker, Lawrence D. Folding chair. 4,123,101, Cl. 297-58.000.

Mishima Kosan Co., Ltd.: *See—*
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.

Mita Industrial Company, Limited: *See—*
Fushida, Akira; Morikawa, Hiroichi; Shinsho, Toshihiro; Miyazaki, Takaaki; and Aizawa, Tatsuo, 4,123,271, Cl. 96-1.800.

Mitchel, Stanley. Operation initiator. 4,122,729, Cl. 74-128.000.

Mitchell, William A.: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,122,755, Cl. 90-11.00A.

Mitobe, Koichi; and Uehara, Yasuhiko, to Hitachi, Ltd. Process for the production of color television picture tubes. 4,123,563, Cl. 427-68.000.

Mitrovic, Milan; and Hayes, Terence J., to Hoffmann-La Roche Inc. Anthelmintics effective against liver flukes. 4,123,553, Cl. 424-311.000.

Mitsubishi Chemical Industries Limited: *See—*
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,123,541, Cl. 424-272.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Anzai, Nobuo, 4,122,919, Cl. 187-29.00R.
Yamamura, Takashi; Tabata, Norikazu; and Yamamoto, Yoshihiko, 4,123,664, Cl. 250-536.000.

Mitsubishi Gas Chemical Company, Inc.: *See—*
Katayama, Masao; and Tabeta, Yataro, 4,123,426, Cl. 260-112.00R.

Mitsui-Nisso Corporation: *See—*
Fukuda, Kiyou; Kawabata, Toshihiko; and Asai, Kiyotsugu, 4,123,412, Cl. 260-30.8DS.

Mittemeijer, Hans R.: *See—*
Schultheiss, Udo F., 4,122,925, Cl. 190-52.000.

Mitzlaff, Michael: *See—*
Warning, Klaus; and Mitzlaff, Michael, 4,123,434, Cl. 260-296.00D.

Miyake, Haruhisa: *See—*
Ukihashi, Hiroshi; Yamabe, Masaaki; and Miyake, Haruhisa, 4,123,602, Cl. 526-206.000.

Miyamoto, Akihiko: *See—*
Takahashi, Jiro; and Miyamoto, Akihiko, 4,123,330, Cl. 96-29.00D.

Miyamoto, Motomu. High speed switching device for switch and breaker. 4,123,638, Cl. 200-153.00G.

Miyamoto, Norioki: *See—*
Iwasaki, Tetsuji; Miyamoto, Norioki; Sugimura, Yukio; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,123,254, Cl. 71-98.000.

Miyasaka, Takao, to Copal Company Limited. Coreless cylindrical armature for electrical rotary machines. 4,123,679, Cl. 310-266.000.

Miyauchi, Hirotsugu: *See—*
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Kimoto, Kyoji; and Masuda, Yoshinori, 4,123,336, Cl. 204-98.000.

Miyazaki, Takaaki: *See—*
Fushida, Akira; Morikawa, Hiroichi; Shinsho, Toshihiro; Miyazaki, Takaaki; and Aizawa, Tatsuo, 4,123,271, Cl. 96-1.800.

Mizuta, Atsuo: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.

Mobay Chemical Corporation: *See—*
Heiss, Herbert L.; Yeater, Robert P.; and Carter, Russell P., Jr., 4,123,419, Cl. 260-45.8NZ.

Mobil Oil Corporation: *See—*
Bridger, Robert F.; and Landis, Phillip S., 4,123,372, Cl. 252-48.200.
Finberg, Arne O., 4,123,417, Cl. 260-42.460.
Williamson, Albert E., 4,123,505, Cl. 423-564.000.

Mochizuki, Taketoshi; Harada, Fumio; Imaizumi, Tadahiro; and Nose, Koichi, to Hitachi, Ltd.; and Shin Meiwa Industry Co., Ltd. Refrigerating system. 4,122,688, Cl. 62-196.00R.

Modine Manufacturing Company: *See—*
Miller, Robert F., 4,123,000, Cl. 236-11.000.

Moeller, Charles R.; and Jeffers, Frederick J., to Eastman Technology, Inc. Magnetic head with mechanically isolated thin film sensor. 4,123,790, Cl. 360-111.000.

Moeser, Denis S., to Leisure Products, Inc. Boat seat latching assembly. 4,122,571, Cl. 9-7.000.

Molari, Richard E., Jr., to General Electric Company. Laminates. 4,123,588, Cl. 428-412.000.

Moldram, Peter A.: *See—*
Gladstone, David J.; and Moldram, Peter A., 4,123,751, Cl. 340-324.00M.

Molins Limited: *See—*
Preston, Edward G., 4,122,859, Cl. 131-84.00B.

Molz, Harold A. Mainsail and/or mizzensail furling device. 4,122,793, Cl. 114-106.000.

Monarch Machine Tool Company, The: *See—*
Gusching, Nagle V.; and Prescott, Ralph E., 4,122,597, Cl. 29-568.000.

Monarch Marking Systems, Inc.: *See—*
Lewis, Richard W., 4,122,986, Cl. 226-198.000.

Monarch Tool & Manufacturing Company: *See—*
Hall, Mitchell A., 4,122,695, Cl. 70-417.000.

Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., to Agfa-Gevaert N.V. Photographic silver halide color material containing fast-acting hardener and 2-pyrazolin-5-one coupler precursors. 4,123,281, Cl. 96-100.00R.

Mongeon, Robert J., to United Technologies Corporation. Apparatus and method for speckle tracking. 4,123,651, Cl. 250-203.00R.

Monsanto Company: *See—*
Coran, Aubert Y., 4,123,411, Cl. 260-30.80R.
McNamara, Michael M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,123,492, Cl. 264-210.00F.

Montedison S.p.A.: *See—*
Credali, Lino; and Guidotti, Vincenzo, 4,123,424, Cl. 528-337.000.

Moog Inc.: *See—*
Pegler, Frederick E. W.; and Laucks, Howard H., 4,122,598, Cl. 29-568.000.

Mookherjee, Braja D.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.

Moore Business Forms, Inc.: *See—*
French, Denis E. E., 4,123,086, Cl. 282-11.50A.

Moore, James E. Briquetting plant. 4,123,209, Cl. 425-74.000.

Moore, Robert R.: *See—*
Eitzen, Vincent E.; and Moore, Robert R., 4,122,998, Cl. 235-475.000.

Moren, Karl-Erik; and Sixtensson, Par S., to Stora Kopparbergs Bergslags AB. Titanium-stabilized deep drawing steel suitable for hot galvanizing. 4,123,261, Cl. 75-125.000.

Moreni, Battista, to Speizman Industries, Inc. Method and means for transferring knit loops between cylinders of a double cylinder knitting machine. 4,122,690, Cl. 66-14.000.

Morikawa, Hiroichi: *See—*
Fushida, Akira; Morikawa, Hiroichi; Shinsho, Toshihiro; Miyazaki, Takaaki; and Aizawa, Tatsuo, 4,123,271, Cl. 96-1.800.

Morioka, Atsumi; and Nakashima, Tamotsu, to Toray Industries, Inc. False-twist yarn and process. 4,122,658, Cl. 57-140.00R.

Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, to Toyo Jozo Company, Ltd.; and Asahi Kasei Kogyo Kabushiki Kaisha. Process for producing cellulose microcapsules, and resulting cellulose microcapsules. 4,123,381, Cl. 252-316.000.

Morishita, Yoshiyuki: *See—*
Hanyo, Susumu; Yamaguchi, Jousuke; Morishita, Yoshiyuki; and Noguchi, Itoshi, 4,122,697, Cl. 72-128.000.

Moriyama, Taketoshi: *See—*
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.

Morley, Edward G.: *See—*
James, Nicholas A.; Hudson, John A.; Savage, Derek G.; and Morley, Edward G., 4,123,202, Cl. 417-216.000.

Morley, John S.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., 4,123,523, Cl. 424-177.000.

Morris, Neal R. Reusable closures for hermetically sealing containers. 4,122,964, Cl. 215-260.000.

Morrison, Francis J.: *See—*
Bard, John A.; and Morrison, Francis J., 4,122,641, Cl. 52-403.000.

Morrison, Robert J., to Hughes Aircraft Company. Optical fiber connector. 4,123,138, Cl. 350-96.210.

Morse, Glenn B.: *See—*
Runge, Glen V.; and Morse, Glenn B., 4,122,637, Cl. 52-3.000.

Morse, Lewis D.; Walker, William G.; and Hammes, Paul A., to Merck & Co., Inc. Method of microencapsulation. 4,123,382, Cl. 252-316.000.

Moses, Pinchas: *See—*
Jonsson, Nils A.; Mikiver, Lembit; and Moses, Pinchas, 4,123,543, Cl. 424-274.000.

Moshofsky, Jerome F.; and Vanderzanden, Allan J., to Hyster Company. Fuel supply control and carburetor linkage mechanism. 4,122,819, Cl. 123-198.00D.

Mosior, Donald J.; Cawood, Charles D., Jr.; and Ekinaka, Michael H., to American Hospital Supply Corporation. Surgical instrument and method of assembly thereof. 4,122,856, Cl. 128-311.000.

Moskowitz, Ronald; Stahl, Philip; and Reed, Walter R., to Ferrofluidics Corporation. Inertia damper using ferrofluid. 4,123,675, Cl. 310-49.00R.

Motorola, Inc.: *See—*
Peterson, Benjamin C., 4,123,799, Cl. 365-205.000.

Mowe, Wayne T.: *See—*
McNamara, Michael M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,123,492, Cl. 264-210.00F.

Mozley, Richard H., to National Research Development Corporation. Cyclone construction and fixing. 4,123,364, Cl. 210-512.00M.

Mrofchak, John J. Energy saving device utilizing normally wasted heat from clothes dryers. 4,122,612, Cl. 34-86.000.

Muir, Samuel: *See—*
Riley, Ralph V.; Muir, Samuel; Bloor, Christopher; and Jozsef, Tibor, 4,123,264, Cl. 75-211.000.

Muller, Helmut: *See*—
Gilg, Bernard; Muller, Helmut; and Rody, Jean, 4,123,418, Cl. 260-45.8NT.
Muller, Jens: *See*—
Lange, Fritz-Walter; Jacobi, Haireddin; and Muller, Jens, 4,123,548, Cl. 424-274.000.
Muller, Michael: *See*—
Keller, Roderich; and Muller, Michael, 4,123,686, Cl. 313-230.000.
Munter, Ernst A., to Northern Telecom Limited. Digital echo attenuation circuit for a telephone system. 4,123,626, Cl. 179-170.200.
Murakami, Mitsuo, to Kabushiki Kaisha Famy. Baby walker with device for supporting stem for beads. 4,123,078, Cl. 280-87.02W.
Muramatsu, Norimichi: *See*—
Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, 4,123,554, Cl. 424-324.000.
Murata Manufacturing Co., Ltd.: *See*—
Ito, Katsuo; and Yoshimura, Kazunori, 4,123,781, Cl. 358-191.000.
Yoshikawa, Masazi; and Sawada, Tomoe, 4,123,688, Cl. 315-58.000.
Murata, Taneo, to Alps Electric Co., Ltd. Pushbutton switch. 4,123,641, Cl. 200-340.000.
Murray, George G., to Strikemaster Manufacturing Corp., The. Molded plastic bowling pin and method for the manufacture thereof. 4,123,057, Cl. 273-82.00R.
Murtha, Timothy P., to Phillips Petroleum Company. Biaryl production. 4,123,470, Cl. 260-668.00D.
Musyt, William, to Goodyear Aerospace Corporation. Building form for molded articles having a urethane coating. 4,123,582, Cl. 428-335.000.
Muto, Toshiya, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Turn signal mechanism for use in motor vehicles. 4,123,632, Cl. 200-61.270.
Myrens Verksted A/S: *See*—
Fritzvold, Bjorn H.; Carling, Helge; and Eriksen, Leif H., 4,123,317, Cl. 162-17.000.
Nagarajan, Ramakrishnan: *See*—
Gorman, Marvin; Higgens, Calvin E.; and Nagarajan, Ramakrishnan, 4,123,612, Cl. 544-16.000.
Nagata, Koichi; Oda, Takashi; and Yamashita, Koji, to Nippon Electric Co., Ltd. Built-in miniature radio antenna. 4,123,756, Cl. 343-702.000.
Nagel, Robert I.: *See*—
Schueler, Arthur P.; and Nagel, Robert I., 4,123,181, Cl. 404-9.000.
Nakahara, Tsuneo; Hoshikawa, Masao; Shiraishi, Satoshi; Kurosaki, Shiro; and Fujiwara, Kunio, to Sumitomo Electric Industries, Ltd. Manufacturing method of an optical waveguide. 4,123,483, Cl. 264-1.000.
Nakajima, Koe: *See*—
Midzutani, Wataru; Nakajima, Koe; Kikuma, Toshio; Ondo, Keitaku; and JPX, 4,122,696, Cl. 72-52.000.
Nakamatsu, Yoshiro. Golfclub. 4,123,056, Cl. 273-78.000.
Nakamura, Issei: *See*—
Inowa, Shigeru; Nakamura, Issei; and Furuya, Tutomu, 4,123,156, Cl. 355-3.0SC.
Nakamura, Moritoshi; and Nakanowatari, Jun, to Alps Electric Co., Ltd. Variable resistor. 4,123,742, Cl. 338-137.000.
Nakamura, Moritoshi: *See*—
Kiyono, Tetsuhiro; Nakamura, Moritoshi; and Nakanowatari, Jun, 4,123,741, Cl. 338-121.000.
Nakamura, Yoshio: *See*—
Tanaka, Tsutomu; Nakamura, Yoshio; Asahi, Koji; Shiraishi, Tadayoshi; and Takahara, Kenji, 4,123,329, Cl. 195-28.00R.
Nakanowatari, Jun: *See*—
Kiyono, Tetsuhiro; Nakamura, Moritoshi; and Nakanowatari, Jun, 4,123,741, Cl. 338-121.000.
Nakamura, Moritoshi; and Nakanowatari, Jun, 4,123,742, Cl. 338-137.000.
Nakashima, Tamotsu: *See*—
Morioka, Atsumi; and Nakashima, Tamotsu, 4,122,658, Cl. 57-140.00R.
Nakayama, Noboru: *See*—
Tasaki, Yoshio; Nakayama, Noboru; and Kajihara, Hiroshi, 4,122,990, Cl. 228-2.000.
Nalbach, John C., to John R. Nalbach Engineering Co., Inc. Apparatus for filling containers. 4,122,876, Cl. 141-150.000.
Nalco Chemical Company: *See*—
Vartiak, Joseph F.; and Wortley, George E., Jr., 4,123,249, Cl. 71-66.000.
Vossos, Peter H., 4,123,234, Cl. 55-5.000.
Narutomi, Yasuhisa: *See*—
Kita, Nobuyuki; and Narutomi, Yasuhisa, 4,123,276, Cl. 96-91.00R.
Nasutavicus, Wilmonte A.: *See*—
Grinstead, Robert R.; Jones, Kenneth C.; and Nasutavicus, Wilmonte A., 4,123,435, Cl. 260-307.00D.
National Patent Development Corporation: *See*—
Kita, Nobuyuki; and Narutomi, Yasuhisa, 4,123,276, Cl. 96-91.00R.
National Research Development Corporation: *See*—
Mozley, Richard H., 4,123,364, Cl. 210-512.00M.
National Super Service Company, The: *See*—
Bevington, John F.; Savidge, Michael; and Meeker, Paul, 4,122,576, Cl. 15-49.00R.
National Union Electric Corporation: *See*—
Zauner, John H.; and Waller, Lyle G., 4,123,597, Cl. 429-112.000.
Naturin-Werk Becker & Do.: *See*—
Korlatzki, Rudi; and Schuhmacher, Gunter, 4,123,589, Cl. 428-425.000.
Naworski, Joseph S.: *See*—
Campbell, Ramsey G.; Doane, Elliott P.; Heines, M. Henry; Naworski, Joseph S.; and Vogt, Harvey J., 4,123,467, Cl. 260-659.00A.
Nebe, Juergen: *See*—
Port, Morton I.; Nebe, Juergen; and Ladeur, Bernhard H., 4,123,577, Cl. 428-95.000.
Nehma, Roland E. Tube connector. 4,123,180, Cl. 403-172.000.
Nelson, Norman E., to Minnesota Mining and Manufacturing Company. Tape cartridge with self-aligning tape transport roller. 4,122,985, Cl. 226-181.000.
Nelson, Robert H., to General Motors Corporation. System for controlling vehicle movement over a fixed guideway. 4,123,023, Cl. 246-182.00B.
Nelson, Wayne F., to Dow Chemical Company, The. Tubing tester. 4,122,898, Cl. 166-325.000.
Nemoto, Takayuki: *See*—
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.
Netherton, Charles F.: *See*—
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,123,297, Cl. 148-103.000.
Nettleton, Donald E., Jr.; Doyle, Terrence W.; and Bradner, William T., to Bristol-Myers Company. Antibiotic compound. 4,123,608, Cl. 536-17.000.
Neubert, Frederic B.; and Coldren, Kenneth M., to M & W Gear Company. Combination grain discharge chute construction for dump wagon. 4,122,932, Cl. 193-5.000.
Neuman, Andrew: *See*—
Leister, Norman A.; and Neuman, Andrew, 4,123,368, Cl. 252-25.000.
Newell, Stanley E., to Boeing Company, The. Anemometer compensator linearizer. 4,122,722, Cl. 73-362.0AR.
Newland, William M., to Hercules Supply Company. Ductboard collar. 4,123,093, Cl. 285-189.000.
Newton, Richard C.: *See*—
Borenstein, David E.; and Newton, Richard C., 4,122,588, Cl. 28-221.000.
Nickerson, William A.: *See*—
Keller, James R.; and Nickerson, William A., 4,123,315, Cl. 156-560.000.
Nielsen, Helmar. Picture frame. 4,122,617, Cl. 40-155.000.
Nieto de Moreno, Pierre A., to Societe Soberal S.A. Apparatus for decelerating descending bodies. 4,122,934, Cl. 193-32.000.
Nihon Beru-Haueru Kabushiki Kaisha: *See*—
Isono, Tadao, 4,123,765, Cl. 354-25.000.
Nihon Pipeline Service Kabushiki Kiahsa: *See*—
Sagawa, Teikichi, 4,122,575, Cl. 15-104.06R.
Nihon Radiator Co., Ltd.: *See*—
Suyama, Eizo, 4,122,914, Cl. 181-258.000.
Nikai, Isao: *See*—
Isshiki, Naotsugu; Nikai, Isao; and Uchida, Hiroyuki, 4,122,680, Cl. 60-649.000.
Niks, Anton: *See*—
Van Hijfte, Willy H. P.; Vanmarcke, Luc A.; and Niks, Anton, 4,123,570, Cl. 427-222.000.
Nippon Electric Co., Ltd.: *See*—
Nagata, Koichi; Oda, Takashi; and Yamashita, Koji, 4,123,756, Cl. 343-702.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,122,743, Cl. 84-1.240.
Yamashita, Toshinori, 4,122,747, Cl. 84-411.00R.
Nippon Jido Seigyo, Ltd.: *See*—
Uchiyama, Yasushi; and Awamura, Daikichi, 4,123,170, Cl. 356-167.000.
Nippon Piston Ring Co., Ltd.: *See*—
Takahashi, Kentaro; and Urano, Shigeru, 4,123,265, Cl. 75-211.000.
Nippon Prosensor Co., Ltd.: *See*—
Otani, Hiroaki, 4,123,748, Cl. 340-558.000.
Nippon Shinyaku Company, Limited: *See*—
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,123,541, Cl. 424-272.000.
Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,122,802, Cl. 123-3.000.
Nippon Steel Corporation: *See*—
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.
Midzutani, Wataru; Nakajima, Koe; Kikuma, Toshio; Ondo, Keitaku; and JPX, 4,122,696, Cl. 72-52.000.
Nishimura, Hideo; and Niwa, Kuniyuki, to Toyoda Koki Kabushiki Kaisha. Cam grinding machine. 4,122,634, Cl. 51-165.710.
Nishino, Tadashi: *See*—
Kajiwara, Toshiyuki; and Nishino, Tadashi, 4,123,011, Cl. 242-78.100.
Nishio, Kazuo: *See*—
Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, 4,123,554, Cl. 424-324.000.
Nissan Motor Company, Limited: *See*—
Hosaka, Akio; and Tsuruta, Eiji, 4,122,667, Cl. 60-39.09R.
Hosaka, Akio; and Sakamoto, Satoshi, 4,122,807, Cl. 123-117.00R.
Hosaka, Akio; and Tsuruta, Eiji, 4,123,721, Cl. 330-69.000.

Iwasa, Yoshio, 4,122,809, Cl. 123-119.0EC.
Oda, Takaaki; and Yokokura, Chiyokatsu, 4,123,085, Cl. 280-752.000.
Nisshin Steel Company Ltd.: *See—*
Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, 4,123,257, Cl. 75-40.000.
Niwa, Kuniyuki: *See—*
Nishimura, Hideo; and Niwa, Kuniyuki, 4,122,634, Cl. 51-165.710.
Nixdorf Computer AG: *See—*
Pollmeier, Werner, 4,123,670, Cl. 307-254.000.
Noguchi, Itoshi: *See—*
Hanyo, Susumu; Yamaguchi, Jousuke; Morishita, Yoshiyuki; and Noguchi, Itoshi, 4,122,697, Cl. 72-128.000.
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming system. 4,122,802, Cl. 123-3.000.
Noguchi, Masaaki; and Bunda, Tsuchio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auto emission purifying catalyst and method of manufacture. 4,123,391, Cl. 252-466.0PT.
Nomine, Harold; and Schempp, Eberhard G., to Pennsylvania Engineering Corporation. Gas cleaning system for metallurgical apparatus. 4,123,043, Cl. 266-158.000.
Nomura, Tatsuo: *See—*
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,123,541, Cl. 424-272.000.
Nomura, Yoshiyuki: *See—*
Shichida, Hiromichi; Gamo, Gotaro; Nomura, Yoshiyuki; Hattori, Kiyoshi; and Koiwai, Yutaka, 4,123,645, Cl. 219-69.00W.
Nonaka, Yoshio: *See—*
Okikawa, Susumu; Yukawa, Osamu; Mikino, Hiroshi; and Nonaka, Yoshio, 4,123,293, Cl. 148-11.50C.
Nordlund, Karl S.: *See—*
Berglund, Kjell W.; and Nordlund, Karl S., 4,122,963, Cl. 214-512.000.
Norell, Karl T., to AB Bofors. Waste disposal. 4,123,380, Cl. 252-301.10W.
Norris Industries, Inc.: *See—*
Allemann, James G., 4,123,097, Cl. 292-336.300.
Norris, John B.: *See—*
Parrott, George A.; and Norris, John B., 4,123,110, Cl. 299-43.000.
Northern Telecom Limited: *See—*
Chow, Peter E. K., 4,123,625, Cl. 179-16.0EA.
Gagnier, Real; Bourne, John B.; and Terry, John B., 4,123,624, Cl. 179-15.0AT.
Mikhael, Wasfy B., 4,123,712, Cl. 325-137.000.
Munter, Ernst A., 4,123,626, Cl. 179-170.200.
Norton, Gerald W.: *See—*
Rosewarne, William V.; and Norton, Gerald W., 4,123,075, Cl. 279-121.000.
Nose, Koichi: *See—*
Mochizuki, Taketoshi; Harada, Fumio; Imaizumi, Tadahiro; and Nose, Koichi, 4,122,688, Cl. 62-196.00R.
Nothdurft, Carl. Pipe clamp saddle. 4,122,586, Cl. 24-277.000.
Novotny, Raymond J. Burglar alarm. 4,123,752, Cl. 340-545.000.
Nowlin, Thomas E.; and Martineau, Ronald A., to Union Carbide Corporation. Process for chemically bonding a poly-p-xylylene to a thermosetting resin and article produced thereby. 4,123,308, Cl. 156-272.000.
Nuclear Pacific, Inc.: *See—*
Burnett, Thomas W., 4,122,836, Cl. 128-1.100.
Nuebling, Friederich: *See—*
Peleschka, Gerhard; and Nuebling, Friederich, 4,123,205, Cl. 418-127.000.
Nylen, Ulf T. G.: *See—*
Hakansson, Bo H.; Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,123,353, Cl. 210-22.00C.
Oberlin, Robert: *See—*
Kornowski, Henri; Roques, Bernard; Oberlin, Robert; and Jondet, Andre, 4,123,544, Cl. 424-274.000.
O'Brian, Edward D.; and Plachy, William M. Folding structures considered to be primarily useful for play purposes. 4,122,638, Cl. 52-70.000.
O'Brien Corporation, The: *See—*
Thomassen, Ivar P., 4,123,402, Cl. 260-29.2EP.
Obrowski, Frank: *See—*
Waninger, Rudolf; and Obrowski, Frank, 4,122,763, Cl. 99-281.000.
Occidental Petroleum Corporation: *See—*
White, William R.; and Van Tighem, Gary P., 4,122,950, Cl. 209-12.000.
Ochiai, Kanehiro: *See—*
Sanada, Takahiro; and Ochiai, Kanehiro, 4,123,324, Cl. 176-37.000.
Ochiai, Takeji, to Fuji Photo Film Co., Ltd. Copolymer subbing material for photographic elements. 4,123,277, Cl. 96-85.000.
Ochiai, Toshihiko: *See—*
Shimizu, Syogo; Ochiai, Toshihiko; and Sakai, Masato, 4,123,199, Cl. 416-244.00A.
O'Connor, Jeremiah J.; Pilote, Raymond R.; and Linkenheimer, Wayne H., to E. R. Squibb & Sons, Inc. Control of bloat in ruminants. 4,123,522, Cl. 424-116.000.
Oda, Fujio, to Matsushita Electric Industrial Co., Ltd. Thermal head apparatus. 4,123,647, Cl. 219-216.000.
Oda, Takaaki; and Yokokura, Chiyokatsu, to Nissan Motor Company, Limited. Safety panelling arrangement with a deformable structure. 4,123,085, Cl. 280-752.000.
Oda, Takashi: *See—*
Nagata, Koichi; Oda, Takashi; and Yamashita, Koji, 4,123,756, Cl. 343-702.000.
O'Donnell, Phillip P.: *See—*
Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,123,339, Cl. 204-149.000.
Ogasawara, Hideo: *See—*
Sugisaki, Toshihiko; Horiuchi, Tetsuo; Ogasawara, Hideo; Yamanari, Shozo; and Tominaga, Kenji, 4,123,327, Cl. 176-76.000.
Ogawa & Co., Ltd.: *See—*
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,123,525, Cl. 424-200.000.
Ogawa, Hiroshi: *See—*
Takigawa, Hiroyoshi; Watanabe, Shigeo; Aoki, Shigeta; and Ogawa, Hiroshi, 4,122,879, Cl. 152-209.00R.
Ogawa, Hisaharu: *See—*
Aihara, Mitsuo; and Ogawa, Hisaharu, 4,123,671, Cl. 307-270.000.
Ohashi, Yoshie: *See—*
Sumitomo, Yasusuke; and Ohashi, Yoshie, 4,123,565, Cl. 427-88.000.
Ohata, Katsuya: *See—*
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,123,541, Cl. 424-272.000.
Ohkawa, Masahisa: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,123,387, Cl. 252-429.00B.
Ohnishi, Noboru: *See—*
Tsuchiya, Kazuo; and Ohnishi, Noboru, 4,122,840, Cl. 128-2.00S.
Ohori, Tamio: *See—*
Tomita, Satoru; Ohori, Tamio; and Karasawa, Shuichi, 4,123,762, Cl. 346-155.000.
Ohsawa, Mitsuo, to Sony Corporation. FM Receiver with liquid crystal signal indicator. 4,123,714, Cl. 325-455.000.
Ohta, Nobuya: *See—*
Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, 4,123,554, Cl. 424-324.000.
Ohtsuka, Tomoaki. Trap for small animals doing harm to possessions. 4,122,625, Cl. 43-82.000.
Ohya, Masaki: *See—*
Kobayashi, Akio; and Ohya, Masaki, 4,123,576, Cl. 428-35.000.
Okada, Isamu: *See—*
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.
Okikawa, Susumu; Yukawa, Osamu; Mikino, Hiroshi; and Nonaka, Yoshio, to Hitachi, Ltd. Method of providing semiconductor pellet with heat sink. 4,123,293, Cl. 148-11.50C.
Okumura, Takatoshi: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,122,743, Cl. 84-1.240.
Olesch, Reinhard: *See—*
Fishbein, William; Olesch, Reinhard; and Rittenbach, Otto, 4,123,755, Cl. 343-17.10R.
Olinkraft, Inc.: *See—*
Stone, Fred T., 4,123,320, Cl. 162-199.000.
Oliver, Colin C., to EMI Limited. Radiography. 4,123,659, Cl. 250-403.000.
Olschewski, Armin: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,123,121, Cl. 308-6.00C.
Olsen, Everett O., to Foxboro Company, The. Signal handling apparatus. 4,123,696, Cl. 318-623.000.
Olson, Ronald Arthur, to Tektronix, Inc. Oscillographic apparatus for measuring the magnitude and duration and for separately viewing an input signal. 4,123,705, Cl. 324-121.00R.
Olving, Hans P.: *See—*
Deremo, Edwin J.; and Olving, Hans P., 4,123,188, Cl. 408-17.000.
Ondo, Keitaku: *See—*
Midzutani, Wataru; Nakajima, Koe; Kikuma, Toshio; Ondo, Keitaku; and JPX, 4,122,696, Cl. 72-52.000.
Optima-Maschinenfabrik, Dr. Buehler KG: *See—*
Hoffmann, Wilhelm, 4,122,940, Cl. 198-504.000.
Orifice, Philip: *See—*
Mac Intyre, Robert W.; Wysocki, Edward J.; Orifice, Philip; and DiTillio, Ralph, 4,123,630, Cl. 200-52.00R.
Ortega, Antonio. Painting device. 4,122,799, Cl. 118-207.000.
Osaka University, President of: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,123,611, Cl. 542-421.000.
Osamu, Umekawa; Koji, Takemori; and Sakae, Katayama, to Katayama Chemical Works Co., Ltd. Process for the preparation of bromoacetic acid and esters thereof. 4,123,443, Cl. 260-347.400.
Osegowitsch, Viktor: *See—*
Fernandez, Avelino; Glass, Josef; Osegowitsch, Viktor; and Hehn, Wilfried, 4,123,769, Cl. 354-322.000.
Osteen, Mitchell M., to General Electric Company. Discharge lamp ballast circuit. 4,123,690, Cl. 315-258.000.
Oswald, Leo A., to Owens-Corning Fiberglas Corporation. Twist frame control method and apparatus. 4,122,654, Cl. 57-54.000.
Otani, Hiroaki, to Nippon Prosensor Co., Ltd. Burglar alarms utilizing ultrasonic waves. 4,123,748, Cl. 340-558.000.
Otken, Francis P.; and Otken, Henry L. Cultivating system. 4,122,570, Cl. 7-114.000.
Otken, Henry L.: *See—*
Otken, Francis P.; and Otken, Henry L., 4,122,570, Cl. 7-114.000.
Ott, John E.; and Bates, Marvin O., to Punch-Lok Company. Hose clamp applying and removing machine. 4,122,733, Cl. 81-9.300.

Outboard Marine Corporation: *See—*
Holtermann, Theodore J., 4,122,652, Cl. 56-11.300.
Ovshinsky, Stanford R.: *See—*
Klose, Peter H.; and Ovshinsky, Stanford R., 4,123,157, Cl. 355-43.000.
Owens-Corning Fiberglas Corporation: *See—*
Costin, Darryl J., 4,123,263, Cl. 75-172.00R.
Oswald, Leo A., 4,122,654, Cl. 57-54.000.
Owens-Illinois, Inc.: *See—*
Krall, Thomas J., 4,123,218, Cl. 425-535.000.
Lewis, Albert D., 4,123,631, Cl. 200-52.00R.
Oxequip Health Industries Inc.: *See—*
Viero, Laurence; Cannon, John; Rademaker, George; Swanson, Williard; and Fessett, Kenneth, 4,123,089, Cl. 285-39.000.
Oyamada, Takeo; Satoh, Kazuhisa; Tomizawa, Choji; and Ishihara, Takamasa, to Sumitomo Chemical Company, Limited. Process for producing aqueous emulsions of vinyl chloride/vinyl acetate/ethylene terpolymers. 4,123,405, Cl. 260-29.60R.
Ozerova, Alla Ivanovna: *See—*
Kononenko, Viktor Evmenievich; Tamazina, Valentina Nikolaevna; and Ozerova, Alla Ivanovna, 4,123,568, Cl. 427-126.000.
Pacheco, Nelly M. Orthopedic finger piece for writing instruments. 4,123,179, Cl. 401-6.000.
Packard, Douglas R.: *See—*
Rosenbaum, Herman S.; Packard, Douglas R.; and Levin, Harry A., 4,123,498, Cl. 423-2.000.
Packard Instrument Company, Inc.: *See—*
Johnson, James F., 4,122,936, Cl. 198-339.000.
Paddock, Paul F.: *See—*
Varon, Miquel A.; and Paddock, Paul F., 4,123,310, Cl. 156-351.000.
Pako Corporation: *See—*
Strunc, Gerald R., 4,123,649, Cl. 235-92.0PD.
Palfreeman, John S.: *See—*
Pearson, Ronald F.; Lacklison, David E.; Scott, George B.; and Palfreeman, John S., 4,123,783, Cl. 358-230.000.
Palmer, Norman H. G.; and Wiblin, Wayne T., to Towmotor Corporation. Adjustable potentiometer in an accelerator control. 4,123,740, Cl. 338-67.000.
Panlaqui, Clayton E.; and Holt, Lloyd J., to United States of America, Navy. Dependent sway bracing weapon restraints. 4,122,754, Cl. 89-1.50B.
Pappas, George J. Apparatus for and method of examining light. 4,123,161, Cl. 356-99.000.
Parise, Carl, to Parise & Sons, Inc. Steam cleaner dump bucket. 4,122,579, Cl. 15-353.000.
Parise & Sons, Inc.: *See—*
Parise, Carl, 4,122,579, Cl. 15-353.000.
Parisi, Joseph P.: *See—*
Di Liberto, Menno; and Parisi, Joseph P., 4,122,558, Cl. 4-145.000.
Parisien, Rudolph E. Gate and spring hinge therefore. 4,122,630, Cl. 49-386.000.
Park-Ohio Industries, Inc.: *See—*
Sorensen, Phillips N., 4,123,644, Cl. 219-10.570.
Parker-Hannifin Corporation: *See—*
Keresman, Michael A.; and Schueuerman, Curtis H., 4,123,240, Cl. 55-385.00C.
Parker, Robert R.: *See—*
Karalus, George C.; and Parker, Robert R., 4,122,613, Cl. 35-9.00A.
Parrott, George A.; and Norris, John B., to Dresser Europe S.A. Auxiliary device for a mining machine. 4,123,110, Cl. 299-43.000.
Parry, Richard J.: *See—*
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,123,416, Cl. 260-42.180.
Passerini, Norina: *See—*
Melloni, Piero; Della Torre, Arturo; Lauria, Francesco; Passerini, Norina; Rossi, Alessandro; and Tommasini, Raffaele, 4,123,527, Cl. 424-244.000.
Passoni, Gianfranco. Pair of rollers for roller-skates. 4,123,076, Cl. 280-11.270.
Paszyc, Aleksy J.; Shiroma, Dallas M.; and Huang, Kwang T., to United States of America, Navy. Electrostatic high potential system. 4,123,697, Cl. 322-2.00A.
Patten, Floyd R.: *See—*
Stasz, Peter; and Patten, Floyd R., 4,122,713, Cl. 73-194.00A.
Patterson, Richard J.: *See—*
Ledebuhr, Richard L.; Hansen, Clarence M.; and Patterson, Richard J., 4,122,766, Cl. 99-640.000.
Paulet, Jean: *See—*
Tardy, Maurice; and Paulet, Jean, 4,122,864, Cl. 137-625.600.
Paulonis, Daniel F.: *See—*
Duvall, David S.; and Paulonis, Daniel F., 4,122,992, Cl. 228-176.000.
Pauls, Kurt, to Kieserling & Albrecht. Advancing mechanism for automatic screw thread cutting machines. 4,122,572, Cl. 10-105.000.
Pearce, Jai K.; and Wells, William, to Pennsylvania Engineering Corporation. Steel converter vessel tuyere block construction. 4,123,062, Cl. 266-44.000.
Pearce, Warren, Jr.; and Russo, Andrew, Jr., to General Motors Corporation. Vented electrical connector. 4,123,131, Cl. 339-117.00R.
Pearson, Ronald F.; Lacklison, David E.; Scott, George B.; and Palfreeman, John S., to U.S. Philips Corporation. Magnetic bubble display systems. 4,123,783, Cl. 358-230.000.
Peche, Gerhard: *See—*
Lange, Gerhard; and Peche, Gerhard, 4,123,682, Cl. 313-54.000.
Pecota, Walter, to Wagner Electric Corporation. Automotive dome light control with variable-time automatic holding. 4,123,668, Cl. 307-10.0LS.
Peets, Robert S., to Singer Company, The. Convertible sewing machine cabinet. 4,123,124, Cl. 312-21.000.
Pegler, Frederick E. W.; and Laucks, Howard H., to Moog Inc. Tool changer. 4,122,598, Cl. 29-568.000.
Peleschka, Gerhard; and Nuebling, Friederich, to Wibau. Rotary vane pump with sealing means. 4,123,205, Cl. 418-127.000.
Pell, Kynric M.: *See—*
Brown, David B.; Vickers, Jerry W.; and Pell, Kynric M., 4,123,165, Cl. 356-152.000.
Pellicer, Carlos F.: *See—*
Wesch, Ludwig; Roma, Luis C.; and Pellicer, Carlos F., 4,123,575, Cl. 427-386.000.
Wesch, Ludwig; Roma, Luis C.; and Pellicer, Carlos F., 4,123,587, Cl. 428-407.000.
Pelloni, Luciano: *See—*
Gnieser, Jurgen; and Pelloni, Luciano, 4,123,341, Cl. 204-152.000.
Pemco-Kalamazoo, Inc.: *See—*
Black, John W., 4,122,580, Cl. 16-46.000.
Pennish, John S.: *See—*
Carman, Justice N., 4,123,229, Cl. 422-199.000.
Pennsylvania Engineering Corporation: *See—*
Nomine, Harold; and Schempp, Eberhard G., 4,123,043, Cl. 266-158.000.
Pearce, Jai K.; and Wells, William, 4,123,042, Cl. 266-44.000.
Pennwalt Corporation: *See—*
Cascone, Paul J., 4,123,262, Cl. 75-165.000.
Pepperl, Rudiger: *See—*
Hill, Bernhard; Pepperl, Rudiger; and Kruger, Johann, 4,123,147, Cl. 350-285.000.
Perevuznik, Josef: *See—*
Horler, Hansulrich; and Perevuznik, Josef, 4,123,200, Cl. 417-64.000.
Perkins, John A., to Perky & Me Co. Toy or game. 4,123,052, Cl. 272-8.00N.
Perkins, Walter E., Jr.: *See—*
Wolf, Edward D.; and Perkins, Walter E., Jr., 4,123,661, Cl. 250-492.00A.
Perky & Me Co.: *See—*
Perkins, John A., 4,123,052, Cl. 272-8.00N.
Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., to Minnesota Mining and Manufacturing Company. Transfer letter system. 4,123,309, Cl. 156-234.000.
Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., to Minnesota Mining and Manufacturing Company. Transfer letter system. 4,123,578, Cl. 428-206.000.
Perry, Roger L., to Gillette Company, The. Injector razor adapter. 4,122,600, Cl. 30-90.000.
Persha, Thomas J.; and Jagielski, David, to Bell & Howell Company. Vertically scanning microfilm reader and reader printer. 4,123,699, Cl. 353-26.00R.
Peters, Harry E. Atomic standard with reduced size and weight. 4,123,727, Cl. 331-94.000.
Peterson, Benjamin C., to Motorola, Inc. High speed IFGET sense amplifier/latch. 4,123,799, Cl. 365-205.000.
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., to Columbia Ribbon & Carbon Manufacturing Co., Inc. Direct ribbon inking by gravure. 4,123,569, Cl. 427-141.000.
Peterson, John M.: *See—*
Hall, William C.; and Peterson, John M., 4,123,392, Cl. 252-478.000.
Peterson, William D., II. High pressure high temperature light gas drive shaft seal. 4,123,070, Cl. 277-135.000.
Petitpierre, Jean C.: *See—*
Balli, Heinz; Gunzenhauser, Sigmund; and Petitpierre, Jean C., 4,123,439, Cl. 260-326.50B.
Petricek, Elisabeth: *See—*
Knetsch, Wilfried; and Petricek, Elisabeth, 4,122,852, Cl. 128-303.00R.
Petrolite Corporation: *See—*
Guthrie, David B.; and Leiendecker, Donald M., 4,123,231, Cl. 44-51.000.
Petter, Nigel N.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., 4,123,523, Cl. 424-177.000.
Petzi, Fritz, to Ludwig Riedhammer GmbH & Co. K.G. Tunnel furnace. 4,123,044, Cl. 266-255.000.
Pfaff Industriemaschinen GmbH: *See—*
Klundt, Kurt, 4,122,789, Cl. 112-256.000.
Pfaffli, Paul, to Sandoz Ltd. Psychostimulating 14-amino-14,15-dihydroeburnamenines. 4,123,535, Cl. 424-256.000.
Pfarrwaller, Erwin; and Seifert, Eberhard, to Sulzer Brothers Limited. Control means for controlling the warp let-off of a weaving machine. 4,122,873, Cl. 139-110.000.
Philip Morris Incorporated: *See—*
Rainer, Norman B.; and Wilson, Peter A., 4,123,592, Cl. 428-532.000.
Philips, Edward G.: *See—*
Davidson, Charles P. D.; and Philips, Edward G., 4,122,907, Cl. 180-33.00C.
Philips Roxane, Inc.: *See—*
Tribble, Ronald L.; and Stagg, Charles M., 4,123,519, Cl. 424-88.000.

Phillips Petroleum Company: *See—*
Borenstein, David E.; and Newton, Richard C., 4,122,588, Cl. 28-221.000.
Chapman, Charles C.; and Van Pool, Joe, 4,123,351, Cl. 208-262.000.
Fahey, Darryl R.; and Mahan, John E., 4,123,447, Cl. 260-439.00R.
Murtha, Timothy P., 4,123,470, Cl. 260-668.00D.
Sauber, Charles A.; and Roper, Louis E., 4,123,366, Cl. 252-8.50A.
Sitton, Donald M.; and Terry, Ronald E., 4,122,895, Cl. 166-252.000.
Vanderveen, John W., 4,123,226, Cl. 23-314.000.

Piazza, Matthew R., to Maso-Therm Corporation. Apparatus for uniformly distributing glass fibers. 4,123,212, Cl. 425-82.100.

Piccini, Silvio D. Batting practice method. 4,123,053, Cl. 273-26.00R.

Pickert, Johannes: *See—*
Herold, Wilhelm; and Pickert, Johannes, 4,123,481, Cl. 261-81.000.

Pickett, Wiley J.; and Boye, Albert A. Method and apparatus for applying a connector to electrical conductor strands. 4,123,133, Cl. 339-273.00R.

Pierson, Marvin B.: *See—*
Arnold, Jerry L.; Dunbar, Frank C.; Gibson, Alan F.; and Pierson, Marvin B., 4,123,291, Cl. 148-6.350.
Gibson, Alan F.; and Pierson, Marvin B., 4,123,292, Cl. 148-6.350.

Pieters, Wim J. M.; Carlson, Emery J.; Gates, William E.; and Conner, William C., Jr., to Allied Chemical Corporation. Pyrogenic silica or titania or alpha-alumina cuprous chloride catalyst of hydrogen chloride/oxygen reaction. 4,123,389, Cl. 252-441.000.

Pikul, Richard E., to Puritan Bennett Corporation. Pulmonary diagnostic instrument including breath transducer. 4,122,842, Cl. 128-2.080.

Pilarczyk, Charles E., to Towmotor Corporation. Control lever assembly. 4,122,728, Cl. 74-103.000.

Pilkington Brothers Limited: *See—*
Cockram, David R., 4,123,287, Cl. 106-99.000.

Pilot Man-Nen-hitsu Kabushiki Kaisha: *See—*
Hasegawa, Tetuya; and Itishasi, Akihiro, 4,123,590, Cl. 428-450.000.

Pilote, Raymond R.: *See—*
O'Connor, Jeremiah J.; Pilote, Raymond R.; and Linkenheimer, Wayne H., 4,123,522, Cl. 424-116.000.

Pilousek, Josef: *See—*
Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, 4,123,114, Cl. 302-53.000.

Pinter, Kenneth W.: *See—*
Davis, Abraham D.; and Pinter, Kenneth W., 4,123,581, Cl. 428-318.000.

Pitkanen, Alan R. Convertible jacket/vest garment. 4,122,553, Cl. 2-102.000.

Pitney-Bowes, Inc.: *See—*
Storace, Anthony; and Sette, Paul R., 4,122,906, Cl. 177-213.000.

Pitt, Leland S.: *See—*
Large, George B.; and Pitt, Leland S., 4,123,526, Cl. 424-200.000.

Pittasch, Willi, to Heinze, Richard. Furniture hinge. 4,122,581, Cl. 16-158.000.

Plachy, William M.: *See—*
O'Brian, Edward D.; and Plachy, William M., 4,122,638, Cl. 52-70.000.

Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,123,243, Cl. 65-16.000.

Plaston AG, Kunststoffwerke Hans Frei & Sohne: *See—*
Frei, Roland; Gutmann, Franz; Sieber, Peter; and Koeppel, Peter, 4,123,228, Cl. 422-274.000.

Platt Saco Lowell Limited: *See—*
Anderson, Gordon C.; and Clayton, James W. B., 4,122,655, Cl. 57-58.890.
Shaw, Jack, 4,122,656, Cl. 57-58.910.

Plessey Handel und Investments AG: *See—*
Das, Tapan K.; Boyce, Peter H.; and Fletcher, Graham J., 4,123,724, Cl. 331-1.00A.
James, Nicholas A.; Hudson, John A.; Savage, Derek G.; and Morley, Edward G., 4,123,202, Cl. 417-216.000.

Plibrico (Canada) Limited: *See—*
Buchy, James P., 4,122,642, Cl. 52-511.000.

Ploix, Jean Luc, to Thomson-CSF. Electrophoretic device. 4,123,346, Cl. 204-299.00R.

PMC Industries, Inc.: *See—*
Cave, Lawrence E., 4,123,194, Cl. 408-221.000.

Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes: *See—*
Bonnefon, Alain; Coupard, Alain; and Maffre, Michel, 4,123,476, Cl. 260-897.00A.

Pneutek, Inc.: *See—*
Haytayan, Harry M., 4,122,904, Cl. 173-15.000.

Poapst, Peter A.; and Forsyth, Frank R., to Canadian Patents and Development Limited. Coating of potatoes to prevent greening. 4,123,558, Cl. 426-268.000.

Podl, William J., to Alnor Instrument Company. Diesel engine exhaust temperature monitor. 4,122,720, Cl. 73-346.000.

Poignant, Jean-Claude: *See—*
Vincent, Michel; Remond, Georges; Laubie, Michel; and Poignant, Jean-Claude, 4,123,531, Cl. 424-250.000.

Poirier, Raymond; and Szydlo, Nicolas, to Thomson-CSF. Display system using low energy electrons. 4,123,687, Cl. 313-484.000.

Poirier, Raymond, to Thomson-CSF. Method of filtering analogue signals by transferring electrical charges in a semiconductor medium. 4,123,733, Cl. 333-70.00T.

Polaroid Corporation: *See—*
Schuler, Norman W., 4,123,141, Cl. 350-159.000.

Poler, Stanley. Intra-ocular lens. 4,122,556, Cl. 3-13.000.

Poletto, John F.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,123,456, Cl. 562-503.000.

Pollack, Howard M.: *See—*
Dahab, Richard E.; and Pollack, Howard M., 4,123,136, Cl. 350-16.000.

Pollmeier, Werner, to Nixdorf Computer AG. Transistor switching circuit. 4,123,670, Cl. 307-254.000.

Polyak, Jack. Solar heat supplemented convection air stack with turbine blades. 4,122,675, Cl. 60-398.000.

Pope, Thomas A.; and Holleran, John M., to Republic Steel Corporation. Method for quench hardening steel casings. 4,123,301, Cl. 148-153.000.

Poradek, Jerry C.: *See—*
United States of America, National Aeronautics and Space Administration; Poradek, Jerry C.; and Collins, Dwight D., 4,123,355, Cl. 210-50.000.

Port, Morton I.; Nebe, Juergen; and Ladeur, Bernhard H., to Standard Oil Company (Indiana). Primary backing for tufted carpets and carpets made therefrom. 4,123,577, Cl. 428-95.000.

Porter, Elmer D.: *See—*
Stevens, Joe M.; and Porter, Elmer D., 4,123,633, Cl. 200-61.860.

Portnoy, Norman A.: *See—*
Unrau, David G.; Portnoy, Norman A.; and Hartmann, Peter J., 4,123,398, Cl. 260-17.4CL.

Post Office, The: *See—*
Gladstone, David J.; and Moldram, Peter A., 4,123,751, Cl. 340-324.00M.

Post, Roger L.: *See—*
Kathmann, Stephen J.; Post, Roger L.; Herschler, Michael G.; and Anerino, Sylvester L., 4,123,203, Cl. 417-252.000.

Potter, John M. Self service plant sales rack. 4,122,781, Cl. 108-101.000.

Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., to Smith & Nephew Research Limited. Curable composition comprising a calcium fluoro-alumino silicate glass and poly(carboxylic acid) or precursor thereof. 4,123,416, Cl. 260-42.180.

Potts, Vinson S., to Crown Cork & Seal Company, Inc. Easy opening can end with push-in tabs. 4,122,971, Cl. 220-268.000.

Powers Regulator Company: *See—*
Shih, James Y., 4,123,796, Cl. 364-900.000.

PPG Industries, Inc.: *See—*
Erikson, J. Alden; and Birkmeyer, William J., 4,123,422, Cl. 528-273.000.
Johnson, Randall S., 4,123,246, Cl. 65-104.000.

Prescott, Ralph E.: *See—*
Gusching, Nagle V.; and Prescott, Ralph E., 4,122,597, Cl. 29-568.000.

Pressler, Kurt T.; and Cattell, Scott. Adjustable pennant warning of downed water skiers. 4,122,796, Cl. 116-132.00R.

Prestele, Karl: *See—*
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, 4,122,839, Cl. 128-2.080.

Preston, Edward G., to Molins Limited. Cigarette-making machines. 4,122,859, Cl. 131-84.00B.

Pretini, Gisberto. Apparatus for protecting a room against penetration thereinto of armed persons. 4,122,783, Cl. 109-3.000.

Pretty, John E., to Ford Motor Company. Window wiper assembly. 4,122,578, Cl. 15-250.230.

Price-Pfister Brass Mfg. Co.: *See—*
Tolnai, Julius L., 4,122,726, Cl. 74-21.000.

Price, Robert; and Eisman, Norman, to Universal Scientific Company. Apparatus and method for perforating an article. 4,122,736, Cl. 83-23.000.

Priegel, Jack C., to Autotronic Controls Corporation. Air flow transducer. 4,122,716, Cl. 73-231.00R.

Prince, David C., Jr.; and Koch, Carl C., to General Electric Company. Supersonic compressor with off-design performance improvement. 4,123,196, Cl. 415-181.000.

Procter & Gamble Company, The: *See—*
Davey, Christopher R.; and Buckley, Peter J., 4,123,377, Cl. 252-103.000.
Maguire, Edward J., Jr.; and Staab, Robert A., 4,123,395, Cl. 252-559.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Brouard, Claude M. H. E.; and Ficht, Paulette G., 4,123,429, Cl. 260-147.000.

Prohaska, Hans: *See—*
Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, 4,123,694, Cl. 318-443.000.

Proksch, Frederick D.: *See—*
Miers, Bruce W.; Proksch, Frederick D.; and Welker, Gerald H., 4,122,908, Cl. 180-68.00P.

Pryde, Coralie A.: *See—*
Chandross, Edwin A.; and Pryde, Coralie A., 4,123,562, Cl. 427-58.000.

Puhringer, Othmar, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Method of guiding a cast strand and arrangement for carrying out the method. 4,122,888, Cl. 164-82.000.

Punch-Lok Company: *See—*
Ott, John E.; and Bates, Marvin O., 4,122,733, Cl. 81-9.300.

Puritan Bennett Corporation: *See—*
Pikul, Richard E., 4,122,842, Cl. 128-2.080.
Purves, Robert B.: *See—*
Andersson, Anders O.; and Purves, Robert B., 4,122,674, Cl. 60-39.650.
Purviance, John R. Chuck key holder. 4,123,195, Cl. 408-241.00R.
PYE (Electronic Products Ltd.): *See—*
Hardy, Paul R.; and Spencer, Arthur T., 4,123,132, Cl. 339-246.000.
Quakenbush, Howard M., to Flexsteel Industries, Inc. Swivel seat pedestal. 4,123,028, Cl. 248-425.000.
Quaker Oats Company, The: *See—*
Teter, Edward C., 4,122,727, Cl. 74-56.000.
Queen, David S.; Bell, Peter W.; Dick, Thomas H.; and Edgar, John B., to Sidlaw Industries Limited. Apparatus for making a composite fabric. 4,123,313, Cl. 156-498.000.
Querengasser, Norman A., to Andrew Wilson Company. Compact shelving apparatus. 4,123,126, Cl. 312-201.000.
Quest Automation Limited: *See—*
Eadie, David W.; and Hancock, Charles J., 4,123,763, Cl. 354-4.000.
Quinn, John A., to Du Pont de Nemours, E. I., and Company. Double-negative positive-working photohardenable elements. 4,123,272, Cl. 96-35.100.
Qvarnstrom, Lars A. G.: *See—*
Hakansson, Bo H.; Nylen, Ulf T. G.; and Qvarnstrom, Lars A. G., 4,123,353, Cl. 210-22.00C.
R. T. Vanderbilt Company, Inc.: *See—*
Rieger, Konrad C., 4,123,284, Cl. 106-40.00R.
Rabban, Philipp. Surgical retractor. 4,122,844, Cl. 128-20.000.
Rabedeau, Melbourne E., to International Business Machines Corporation. Optical system for rotating mirror line scanning apparatus. 4,123,135, Cl. 350-6.800.
Rademaker, George: *See—*
Viero, Laurence; Cannon, John; Rademaker, George; Swanson, Williard; and Fessett, Kenneth, 4,123,089, Cl. 285-39.000.
Radiochemical Centre Limited, The: *See—*
Ruddock, Clinton F., 4,123,497, Cl. 423-2.000.
Radkowsky, Alvin; Chien, Ji-Peng; Yang, Chao-Yie; and Hsieh, Horng-Ming, to Institute of Nuclear Energy Research, Atomic Energy Council. Utilization of heavy elements in thermal and epithermal reactors. 4,123,328, Cl. 176-78.000.
Rainer, Norman B.; and Wilson, Peter A., to Philip Morris Incorporated. Process for incorporating flavorant into cellulosic substrates and products produced thereby. 4,123,592, Cl. 428-532.000.
Rammler, David H., to Syntex (U.S.A.) Inc. Novel assay reagents. 4,123,614, Cl. 560-254.000.
Rangaire Corporation: *See—*
Bowen, Leon O., Jr.; and McVean, Michael T., 4,122,835, Cl. 126-299.00D.
Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, to Zemedelsky nakupni a zasobovaci podnik narodni podnik. Arrangement for the pneumatic removal of bulk particulate material from the floor of a storage place. 4,123,114, Cl. 302-53.000.
Raychem Corporation: *See—*
Koht, Lowell I.; Kinsch, Michael J., Jr.; and Humphries, William H., 4,123,047, Cl. 269-238.000.
Raymond Corporation, The: *See—*
Allen, Ralph E.; and Gibson, Christian D., 4,122,957, Cl. 214-16.40A.
Raymond Lee Organization, Inc., The: *See—*
Kanigan, Frederick R., 4,122,905, Cl. 175-396.000.
Raytheon Company: *See—*
Hapgood, William H., 4,122,830, Cl. 126-271.000.
RCA Corporation: *See—*
Cochran, Larry A.; and Shanley, Robert L., II, 4,123,776, Cl. 358-10.000.
Goldschmidt, Arthur M., 4,123,779, Cl. 358-128.000.
Marinelli, Donald P., 4,123,302, Cl. 148-171.000.
Wine, Charles M., 4,123,713, Cl. 325-455.000.
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, to Hoechst Aktiengesellschaft. Process for improving the activity of used supported silver catalysts. 4,123,385, Cl. 252-414.000.
Reed, Walter R.: *See—*
Moskowitz, Ronald; Stahl, Philip; and Reed, Walter R., 4,123,675, Cl. 310-49.00R.
Refractory Products Co.: *See—*
Woodruff, Richard K., 4,122,644, Cl. 52-787.000.
Reider, Samuel B., to General Motors Corporation. Parallel stage fuel combustion system. 4,122,670, Cl. 60-39.650.
Reiner, Lawrence L.: *See—*
Wexler, Howard; and Reiner, Lawrence L., 4,123,062, Cl. 273-248.000.
Reisman, Arnold: *See—*
Balog, Moshe; Berkenblit, Melvin; Chan, See-Ark; and Reisman, Arnold, 4,123,571, Cl. 427-249.000.
Reiss, Karl-Hans; and Killig, Klaus, to Siemens Aktiengesellschaft. Method for determining the density of bodies by means of penetrating rays and apparatus for carrying out said method. 4,123,654, Cl. 250-272.000.
Rembaum, Alan; and Volksen, Willi, to California Institute of Technology. Impregnated metal-polymeric functional beads. 4,123,396, Cl. 526-24.000.
Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; Laubie, Michel; and Poignant, Jean-Claude, 4,123,531, Cl. 424-250.000.
Renaissance Creations, Inc.: *See—*
Barrell, John M., 4,122,639, Cl. 52-90.000.
Renal Systems, Inc.: *See—*
Cosentino, Louis C.; and Springrose, B. Steven, 4,123,091, Cl. 285-39.000.
Rennick, Virgil G. Dock safety apparatus. 4,122,629, Cl. 49-357.000.
Renz, Udo D.; and Memmhardt, Dieter, to Daimler-Benz Aktiengesellschaft. Snap-in connection, especially cover for wheels of passenger motor vehicles. 4,123,111, Cl. 301-37.0TP.
Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,122,584, Cl. 24-230.00A.
Republic Steel Corporation: *See—*
Pope, Thomas A.; and Holleran, John M., 4,123,301, Cl. 148-153.000.
Vild, Joseph P.; Cleary, William I.; and Fox, Donald P., 4,123,708, Cl. 324-224.000.
Research Associates Ltd.: *See—*
Hice, Jaxon O., 4,123,560, Cl. 426-509.000.
Research-Cottrell, Inc.: *See—*
Sapp, Dennis H., 4,122,646, Cl. 52-648.000.
Reuter, Franz G.: *See—*
Hilterhaus, Karl-Heinz; and Reuter, Franz G., 4,123,599, Cl. 521-123.000.
Reuter Technologie GmbH: *See—*
Hilterhaus, Karl-Heinz; and Reuter, Franz G., 4,123,599, Cl. 521-123.000.
Rexnord Inc.: *See—*
Mansouri, Hosein, 4,123,362, Cl. 210-232.000.
Reytblatt, Zinovy V. Photoelastic strain gauge. 4,123,158, Cl. 356-32.000.
Rhoades, John S.; and Rhoades, Patricia G. Aerodynamic device, particularly for sails. 4,122,792, Cl. 114-103.000.
Rhoades, Patricia G.: *See—*
Rhoades, John S.; and Rhoades, Patricia G., 4,122,792, Cl. 114-103.000.
Rhodes, William A. Kinematic synchronous solar heliostat. 4,122,827, Cl. 126-270.000.
Rhone-Poulenc Industries: *See—*
Gay, Michel, 4,123,399, Cl. 260-23.0XA.
Gay, Michel, 4,123,400, Cl. 260-23.0XA.
Rice, John O.: *See—*
Bowler, Lauren L.; and Rice, John O., 4,122,811, Cl. 123-119.0EC.
Richards, Arthur W., to Sphere Investments Limited. Photometric sorters. 4,122,952, Cl. 209-579.000.
Richards, Roy, to Southwire Company. Cooling of continuously cast bar by hydraulic band lifting. 4,122,889, Cl. 164-87.000.
Richardson, Edwin A.: *See—*
Scheuerman, Ronald F.; Richardson, Edwin A.; and Templeton, Charles C., 4,122,896, Cl. 166-250.000.
Richmond, James W.: *See—*
Kern, Kenneth E.; and Richmond, James W., 4,123,628, Cl. 200-38.0FB.
Richter, Helmut: *See—*
Klapdar, Wilhelm; Richter, Helmut; Rommerswinkel, Heinrich-Wilhelm; Spetzler, Edgar; and Wendorff, Jochen, 4,123,258, Cl. 75-58.000.
Ricoh Company, Ltd.: *See—*
Fukuda, Mitsuhisa, 4,122,997, Cl. 235-455.000.
Tomita, Satoru; Ohori, Tamio; and Karasawa, Shuichi, 4,123,762, Cl. 346-155.000.
Riecker, Johann G.: *See—*
Schulte, Fritz; Riecker, Johann G.; and Rozas, Gunther, 4,123,333, Cl. 202-255.000.
Riedel, Tilo, to S.A. Etablissements Francois Salomon & Fils. Ski brake. 4,123,083, Cl. 280-605.000.
Riedl, Josef: *See—*
Rebsdat, Siegfried; Mayer, Sigmund; Alfranseder, Josef; and Riedl, Josef, 4,123,385, Cl. 252-414.000.
Rieger, Konrad C., to R. T. Vanderbilt Company, Inc. Porous ceramic bodies. 4,123,284, Cl. 106-40.00R.
Riley, Ralph V.; Muir, Samuel; Bloor, Christopher; and Jozsef, Tibor, to British Steel Corporation. Production of ferrous bodies. 4,123,264, Cl. 75-211.000.
Rini, Guy T.: *See—*
Carp, Ralph W.; Ang, Leoncio T.; and Rini, Guy T., 4,123,116, Cl. 303-103.000.
Rinker, Gary M. Holding device for cymbals. 4,122,750, Cl. 84-421.000.
Rittenbach, Otto: *See—*
Fishbein, William; Olesch, Reinhard; and Rittenbach, Otto, 4,123,755, Cl. 343-17.10R.
Rixon, Inc.: *See—*
Stuart, Richard L.; and Bhopale, Arvind M., 4,123,710, Cl. 325-38.00A.
Rizzo, Salvatore P.: *See—*
Boulanger, Henry J.; and Rizzo, Salvatore P., 4,123,627, Cl. 200-5.00A.
Robarts, Donald E.: *See—*
Lowe, Wallace A.; and Robarts, Donald E., 4,122,829, Cl. 126-271.000.
Robbins, Clarence R.: *See—*
Kenkare, Divaker B.; Robbins, Clarence R.; and Carson, John C., Jr., 4,122,976, Cl. 222-94.000.
Rober, Herbert E., to General Motors Corporation. O-ring inspection apparatus. 4,122,705, Cl. 73-794.000.
Roberson, Walter H., Sr. Closure plug assembly. 4,122,869, Cl. 138-93.000.

Robert Bosch GmbH: *See*—
Glas, Willi, 4,122,993, Cl. 229-62.500.
Wanner, Karl, 4,123,074, Cl. 279-19.500.
Robertshaw Controls Company: *See*—
Branson, Charles D.; and Demi, Roy C., 4,123,036, Cl. 251-180.000.
Robinson, Graham, to Chloride Silent Power Limited. Cathode structure for sodium sulphur cells. 4,123,596, Cl. 429-104.000.
Robinson, Lloyd A., to SRI International. Microwave method of and apparatus for flaw detection. 4,123,703, Cl. 324-58.50B.
Roblin Industries, Inc.: *See*—
Celms, Harry, 4,122,955, Cl. 211-126.000.
Roch, Jacques L., to Electroglas, Inc. Probe construction. 4,123,706, Cl. 324-158.00P.
Rock, Erwin H.; and Klar, Irwin, to American Electromedics Corporation. Probe tip. 4,122,841, Cl. 128-2.00Z.
Rockwell International Corporation: *See*—
Diggs, Edward J.; and Grebe, Karl, 4,122,921, Cl. 188-79.5GE.
Kaelble, David H., 4,123,409, Cl. 260-29.1SB.
Rody, Jean: *See*—
Gilg, Bernard; Muller, Helmut; and Rody, Jean, 4,123,418, Cl. 260-45.8NT.
Roeschlau, Peter: *See*—
Hundt, Dieter; Gruber, Wolfgang; Klarwein, Michael; and Roeschlau, Peter, 4,123,384, Cl. 252-408.000.
Rogers, Herbert E., Jr.: *See*—
Foley, Edward M.; Dreyer, Dennis G.; and Rogers, Herbert E., Jr., 4,123,266, Cl. 75-244.000.
Rohm and Haas Company: *See*—
Leister, Norman A.; and Neuman, Andrew, 4,123,368, Cl. 252-25.000.
Rohr Industries, Inc.: *See*—
Casutt, Max, 4,122,988, Cl. 227-53.000.
Rohrich, Heinz, to Siemens Aktiengesellschaft. Vacuum-tight window structure for the passage of x-rays and similar penetrating radiation. 4,122,967, Cl. 220-2.30R.
Rolls-Royce Limited: *See*—
Lowrie, Brian W., 4,122,672, Cl. 60-226.00R.
Roma, Luis C.: *See*—
Wesch, Ludwig; Roma, Luis C.; and Pellicer, Carlos F., 4,123,575, Cl. 427-386.000.
Wesch, Ludwig; Roma, Luis C.; and Pellicer, Carlos F., 4,123,587, Cl. 428-407.000.
Roman, Richard C. Method and apparatus for mounting dental die models in dental stone. 4,122,606, Cl. 32-11.000.
Romanov, Nikolai T., deceased: *See*—
Gorodissky, Leonid G.; Romanov, Nikolai T., deceased; and Romanova, Anantasia I., administratrix, 4,122,691, Cl. 68-5.00E.
Romanova, Anantasia I., administratrix: *See*—
Gorodissky, Leonid G.; Romanov, Nikolai T., deceased; and Romanova, Anantasia I., administratrix, 4,122,691, Cl. 68-5.00E.
Romanski, Eric R.: *See*—
Dutt, William H.; and Romanski, Eric R., 4,123,022, Cl. 245-10.000.
Rommerswinkel, Heinrich-Wilhelm: *See*—
Klapdar, Wilhelm; Richter, Helmut; Rommerswinkel, Heinrich-Wilhelm; Spetzler, Edgar; and Wendorff, Jochen, 4,123,258, Cl. 75-58.000.
Roper, Louis E.: *See*—
Sauber, Charles A.; and Roper, Louis E., 4,123,366, Cl. 252-8.50A.
Roques, Bernard: *See*—
Kornowski, Henri; Roques, Bernard; Oberlin, Robert; and Jondet, Andre, 4,123,544, Cl. 424-274.000.
Rosander, Staffan B. F. S. J.; Sedlacek, Miroslav; and Wernholm, Olle S. V. Method and apparatus for compensaton of effects of misalignment between deflecting magnetic fields and a linear accelerator in a race track microtron. 4,123,720, Cl. 328-234.000.
Rosebrock, Theodore L.: *See*—
Chou, Cheng-Chien; and Rosebrock, Theodore L., 4,122,668, Cl. 60-39.16R.
Rosenbaum, Herman S.; Packard, Douglas R.; and Levin, Harry A., to General Electric Company. Process for separating fission product molybdenum from an irradiated target material. 4,123,498, Cl. 423-2.000.
Rosenblatt, William: *See*—
Cowell, Richard D.; Loewrigkeit, Peter; Rosenblatt, William; and Bluestein, Claire, 4,123,421, Cl. 528-65.000.
Rosewarne, William V.; and Norton, Gerald W., to Buck Tool Company. Sleeve-encased jaw chuck. 4,123,075, Cl. 279-121.000.
Ross, Edward E., to Del Monte Corporation. Can filling apparatus and methods and apparatus and methods for conveying and controlling the feeding of wet materials. 4,122,875, Cl. 141-11.000.
Ross, Frank R.: *See*—
Sharp, Jonathan E.; and Ross, Frank R., 4,122,585, Cl. 24-241.0SB.
Ross, Ronald J.: *See*—
Sherman, John D.; and Ross, Ronald J., 4,123,390, Cl. 252-455.00Z.
Rossi, Alessandro: *See*—
Melloni, Piero; Della Torre, Arturo; Lauria, Francesco; Passerini, Norina; Rossi, Alessandro; and Tommasini, Raffaele, 4,123,527, Cl. 424-244.000.
Rossini, Alfred P. Lightweight anchor rail mount. 4,122,794, Cl. 114-210.000.
Rost, Helmut: *See*—
Weiss, Karl; and Rost, Helmut, 4,122,587, Cl. 128-134.000.
Rostron, Joseph R., to Westinghouse Electric Corp. Multi-pole high-voltage circuit-interrupter having independent pole tripping with a single common operating mechanism. 4,123,635, Cl. 200-148.00F.
Roti Roti, Linda W.: *See*—
Townsend, Leroy B.; Lewis, Arthur F.; and Roti Roti, Linda W., 4,123,524, Cl. 424-180.000.
Rotter, Franz, to Energy Recovery Research Group, Inc. Process and apparatus for carbonizing a comminuted solid carbonizable material. 4,123,332, Cl. 201-15.000.
Rotter, Gerhard; Buchan, William A.; and an der Heiden, Rainer E., to BASF Aktiengesellschaft. Servo arrangement for the recording tape drive in broadband signal reproducing systems. 4,123,773, Cl. 358-4.000.
Rotter, Gerhard; Bakowski, Alojzy; and Burdorf, Donald L., to BASF Aktiengesellschaft. Magnetic transducer device with outrigger bars. 4,123,791, Cl. 360-130.000.
Rowe, E. Riley; Fletcher, Wade; Markert, Herman R.; and Grady, Dwight D., to Sonoco Products Company. Peel-top container assembly system. 4,122,790, Cl. 113-120.00R.
Rowley, William N.: *See*—
Ehret, Gordon F.; and Rowley, William N., 4,122,592, Cl. 29-404.000.
Roy, Alexander R.; and Clarke, Anthony B. Synthetic RD diamond particles. 4,122,636, Cl. 51-298.00R.
Roy, Gerald L., to Kerr Glass Manufacturing Corporation. Linerless closure. 4,122,965, Cl. 215-344.000.
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Kuhlmann, Wolf; Rumpp, Gerhard; and Busler, Albert, 4,122,753, Cl. 85-74.000.
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Levizzari, Giannetto; and Ruspa, Giacomo, 4,122,723, Cl. 73-579.000.
Russell, A. G. Pocket scabbard for knife. 4,122,984, Cl. 224-2.00D.
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Pearce, Warren, Jr.; and Russo, Andrew, Jr., 4,123,131, Cl. 339-117.00R.
Ryan, John E. Guidepost for roadways and the like. 4,123,183, Cl. 404-10.000.
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Evans, David M., 4,123,639, Cl. 200-254.000.
S I G Schweizerische Industrie-Gesellschaft: *See*—
Walz, Theo; and Glauser, Fritz, 4,122,938, Cl. 198-411.000.
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Grant, Herbert L., 4,123,561, Cl. 426-600.000.
Saarbergwerke Aktiengesellschaft: *See*—
Leibrock, Kurt, 4,123,216, Cl. 425-431.000.
Wurfel, Helmut, 4,123,348, Cl. 208-10.000.
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Amin, Surendra A.; Bollen, Phillip S.; and Sacks, William, 4,123,473, Cl. 260-860.000.
Saeki, Yoshito: *See*—
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,123,525, Cl. 424-200.000.
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Shibano, Yoshizo; Saito, Tamao; and Saikawa, Toshiaki, 4,123,758, Cl. 343-830.000.
Saint-Gobain Industries: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,123,243, Cl. 65-16.000.
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Ruff, Alonzo W., 4,122,685, Cl. 62-80.000.
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Osamu, Umekawa; Koji, Takemori; and Sakae, Katayama, 4,123,443, Cl. 260-347.400.
Sakaguchi, Shinji: *See—*
Karino, Yukio; Sakaguchi, Shinji; and Yoshida, Takashi, 4,123,275, Cl. 96-77.000.
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Shimizu, Syogo; Ochiai, Toshihiko; and Sakai, Masato, 4,123,199, Cl. 416-244.00A.
Sakamoto, Satoshi: *See—*
Hosaka, Akio; and Sakamoto, Satoshi, 4,122,807, Cl. 123-117.00R.
Sakurai, Hisayuki: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,123,611, Cl. 542-421.000.
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Salzmann, Ferdinand F., to Consolidated Foods Corporation. Vertical venetian blind construction. 4,122,884, Cl. 160-168.00R.
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Sanders, James M.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
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Sandford, Robert W., Jr., to Dow Corning Corporation. Process for coating a substrate and an improved coating therefore. 4,123,604, Cl. 528-31.000.
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Hasspacher, Klaus; and Strasser, Michael, 4,123,545, Cl. 424-274.000.
Holliger, Herbert; and Wicki, Heinz, 4,123,428, Cl. 260-145.00C.
Pfaffli, Paul, 4,123,535, Cl. 424-256.000.
Sapp, Dennis H., to Research-Cottrell, Inc. Equilateral derrick structure. 4,122,646, Cl. 52-648.000.
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Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.
Sasaki, Toshio: *See—*
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,123,387, Cl. 252-429.00B.
Sasse, Wolfgang H. F.; and Teitei, Tsutomu, to Commonwealth Scientific and Industrial Research. Chemical storage of radiant energy. 4,123,219, Cl. 432-1.000.
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Minemura, Hajime; Kusama, Haruya; and Sato, Shoichi, 4,123,066, Cl. 274-10.00C.
Sato, Shunichi; Kawasaki, Midori; and Kunii, Mamoru, to Kubushiki Kaisha Kokugo. Method and apparatus for fixing glove to glove box and glove suitable therefor. 4,123,123, Cl. 312-1.000.
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Satoh, Kazuhisa: *See—*
Oyamada, Takeo; Satoh, Kazuhisa; Tomizawa, Choji; and Ishihara, Takamasa, 4,123,405, Cl. 260-29.60R.
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Sauer, Hartmut K., to Koenig & Bauer Aktiengesellschaft. Blanket clamping apparatus. 4,122,774, Cl. 101-415.100.
Saunders, Norman B. Heating and ventilation system. 4,123,002, Cl. 237-1.00A.
Savage, Derek G.: *See—*
James, Nicholas A.; Hudson, John A.; Savage, Derek G.; and Morley, Edward G., 4,123,202, Cl. 417-216.000.
Savage, Kerry D.: *See—*
Brown, Winthrop K.; Bridges, James R.; and Savage, Kerry D., 4,122,709, Cl. 73-136.00A.
Savidge, Michael: *See—*
Bevington, John F.; Savidge, Michael; and Meeker, Paul, 4,122,576, Cl. 15-49.00R.
Sawada, Tomoe: *See—*
Yoshikawa, Masazi; and Sawada, Tomoe, 4,123,688, Cl. 315-58.000.
Sawvel, Thomas D. Cover positioning and placement device for square containers. 4,122,649, Cl. 53-306.000.
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Weber, Robert; Katscher, Erich; and Schabert, Hans-Peter, 4,123,323, Cl. 176-30.000.
Scharrenbroich, Helmut: *See—*
Fischer, Stefan; Wollschlager, Dieter; Scharrenbroich, Helmut; and Fischer, Rainer, 4,123,217, Cl. 425-525.000.
Schaub, Robert E.: *See—*
Bernady, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,123,456, Cl. 562-503.000.
Schedrovitsky, Savely S.: *See—*
Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I., 4,123,735, Cl. 336-30.000.
Scheiwiller, Kurt. Spring type apparatus for the projecting of footballs and the like. 4,122,822, Cl. 124-54.000.
Schempp, Eberhard G.: *See—*
Nomine, Harold; and Schempp, Eberhard G., 4,123,043, Cl. 266-158.000.
Schering Corporation: *See—*
Sherlock, Margaret H., 4,123,433, Cl. 260-294.900.
Scheuerman, Ronald F.; Richardson, Edwin A.; and Templeton, Charles C., to Shell Oil Company. Acidizing carbonate reservoirs with chlorocarboxylic acid salt solutions. 4,122,896, Cl. 166-250.000.
Schiff, Peter. Adapter for intra-aortic balloons and the like. 4,122,858, Cl. 128-348.000.
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Schilling, Guenther: *See—*
Givner, Morris L.; and Schilling, Guenther, 4,123,224, Cl. 422-59.000.
Schilter, Eugen: *See—*
Jochum, Peter; and Schilter, Eugen, 4,122,987, Cl. 227-10.000.
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Ingram, John D., 4,123,744, Cl. 340-15.5TN.
Schmid, Gunter; and Jeker, Rudolf, to Automation Industrielle SA. Apparatus for producing collapsible containers. 4,123,312, Cl. 156-466.000.
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Schmidt, Robert R.: *See—*
Hack, Helmut; Schmidt, Robert R.; and Dickore, Karlfried, 4,123,253, Cl. 71-93.000.
Schneider GmbH & Co.: *See—*
Schuster, Peter; and von Chiari, Bernd, 4,123,285, Cl. 106-40.00R.
Schneider, Jacob D.: *See—*
Lapp, Roger H.; and Schneider, Jacob D., 4,123,757, Cl. 343-766.000.
Schneider, Richard S.: *See—*
Soffer, Michael J.; and Schneider, Richard S., 4,123,431, Cl. 260-292.000.
Schnez, Harald, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the removal of fission-product inert gases in the reprocessing of nuclear fuel material. 4,123,484, Cl. 264-0.500.
Schockelt, Guenter G.: *See—*
Lott, Donald L.; Schockelt, Guenter G.; and Worrix, Matthew L., 4,123,637, Cl. 200-148.00A.
Schockmel, Robert: *See—*
Metz, Paul; Schockmel, Robert; and Mersch, Roland, 4,123,247, Cl. 65-141.000.
Schoenlein, William J.: *See—*
Peterson, Glenn E.; Emerson, Robert T.; and Schoenlein, William J., 4,123,569, Cl. 427-141.000.
Scholl, Hans; and Bernewasser, Horst, to Kochs Adler AG. Workpiece support for sewing devices. 4,122,785, Cl. 112-121.150.
Scholle Corporation: *See—*
Scholle, William R., 4,123,204, Cl. 417-393.000.
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Schormann, Josef: *See—*
Hollander, Werner; and Schormann, Josef, 4,123,159, Cl. 356-38.000.
Schramm, Jurgen: *See—*
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,123,449, Cl. 260-453.0AR.
Schranz, Karl-Wilhelm: *See—*
Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.
Schreiber, William L.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
Schroter, Richard C.: *See—*
Commins, Alfred D.; Kindelvich, Frederick T.; and Schroter, Richard C., 4,122,640, Cl. 52-248.000.
Schucht, Peter, to Siemens Aktiengesellschaft. Circuit for synchronizing the oscillation of an oscillator keyed by a pulse, with a reference oscillation. 4,123,726, Cl. 331-14.000.
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Keresman, Michael A.; and Schueuerman, Curtis H., 4,123,240, Cl. 55-385.00C.
Schuhmacher, Gunter: *See—*
Korlatzki, Rudi; and Schuhmacher, Gunter, 4,123,589, Cl. 428-425.000.
Schuit, George C. A.: *See—*
Gates, Bruce C.; Magnotta, Vincent L.; and Schuit, George C. A., 4,123,379, Cl. 252-184.000.
Schuler, Norman W., to Polaroid Corporation. Window system comprising light polarizers. 4,123,141, Cl. 350-159.000.
Schulte, Fritz; Riecker, Johann G.; and Rozas, Gunther, to Hartung, Kuhn & Co. Maschinenfabrik GmbH. Duct equipment for exhausting coke gases. 4,123,333, Cl. 202-255.000.
Schultheiss, Udo F., to Mittemeijer, Hans R. Combined suitcase and briefcase. 4,122,925, Cl. 190-52.000.
Schultz, Karl-Heinz: *See—*
Kohler, Klaus; Woditsch, Peter; and Schultz, Karl-Heinz, 4,123,501, Cl. 423-152.000.
Schulz, Albert C., to Combustion Engineering, Inc. Briquette forming apparatus. 4,123,210, Cl. 425-78.000.
Schuster, Peter; and von Chiari, Bernd, to Schneider GmbH & Co. Foamed ceramic element. 4,123,285, Cl. 106-40.00R.
Schwartzkopf, Gary S.: *See—*
Bieringer, Harold F.; Jones, Derrell G.; and Schwartzkopf, Gary S., 4,122,758, Cl. 92-23.000.
Schwarz, Albert J.: *See—*
Kotsakis, Mike D.; and Schwarz, Albert J., 4,123,090, Cl. 285-39.000.
Science Union et Cie, Societe Francaise de Recherche Medicale: *See—*
Vincent, Michel; Remond, Georges; Laubie, Michel; and Poignant, Jean-Claude, 4,123,531, Cl. 424-250.000.
Sclove, David B.: *See—*
Heil, Walter P.; and Sclove, David B., 4,123,270, Cl. 96-1.50R.
SCM Corporation: *See—*
Eaton, John L., Jr., 4,123,743, Cl. 338-322.000.
Scott, George B.: *See—*
Pearson, Ronald F.; Lacklison, David E.; Scott, George B.; and Palfreeman, John S., 4,123,783, Cl. 358-230.000.
Scott, Steven W.: *See—*
Holub, Fred F.; Scott, Steven W.; and Wilson, Phillip S., 4,123,436, Cl. 260-30.80R.
Scovill Manufacturing Company: *See—*
Holdiman, Joe W., 4,122,633, Cl. 49-501.000.
Sebestyen, Gyula: *See—*
Hermecz, Istvan; Meszaros, Zoltan; Virag, Sandor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; Knoll, Jozsef; Sebestyen, Gyula; and David, Agoston, 4,123,533, Cl. 424-251.000.
Sedlacek, Miroslav: *See—*
Rosander, Staffan B. F. S. J.; Sedlacek, Miroslav; and Wernholm, Olle S. V., 4,123,720, Cl. 328-234.000.
Sefton, Verner B.; and Kofluk, Russell P., to Sherritt Gordon Mines Limited. Selective recovery of nickel and cobalt or copper and zinc from solution. 4,123,260, Cl. 75-117.000.
Seifert, Eberhard: *See—*
Pfarrwaller, Erwin; and Seifert, Eberhard, 4,122,873, Cl. 139-110.000.
Seilly, Alec H., to Lucas Industries Limited. Electromagnetic devices. 4,123,691, Cl. 318-119.000.
Seki, Ikuo: *See—*
Kato, Masahiko; Katogi, Hisao; and Seki, Ikuo, 4,123,171, Cl. 356-175.000.
Sekiguchi, Takeshi, to Canon Kabushiki Kaisha. Color television camera having an auxiliary illumination source. 4,123,777, Cl. 358-55.000.
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Selas Corporation of America: *See—*
Bates, William G., 4,123,245, Cl. 65-104.000.
Selcuk, M. Kudret: *See—*
United States of America, National Aeronautics and Space Administration; and Selcuk, M. Kudret, 4,122,833, Cl. 126-271.000.
Sellstedt, John H.; and Klaubert, Dieter H., to American Home Products Corporation. Tetrazole-5-carboxamide derivatives. 4,123,432, Cl. 260-293.690.
Sendyk, Andrzej M.: *See—*
Dodds, David E.; Sendyk, Andrzej M.; and Wohlberg, Donald B., 4,123,709, Cl. 325-38.00B.
Septier, Jacqueline. Tennis racket frame. 4,123,054, Cl. 273-73.00F.
Sery, Jacques; and Couture, Serge A. E., to Compagnie Honeywell Bull (Societe Anonyme). Control arrangement for a belt printer. 4,122,769, Cl. 101-93.180.
Sette, Paul R.: *See—*
Storace, Anthony; and Sette, Paul R., 4,122,906, Cl. 177-213.000.
Seyl, Rogert G. Voltage measurement with spaced reference electrode. 4,123,335, Cl. 204-1.00T.
Shalita, Paul: *See—*
Ryan, John R.; and Shalita, Paul, 4,123,140, Cl. 350-105.000.
Shanley, Robert L., II: *See—*
Cochran, Larry A.; and Shanley, Robert L., II, 4,123,776, Cl. 358-10.000.
Sharp, Jonathan E.; and Ross, Frank R. Single-action double-lock snap. 4,122,585, Cl. 24-241.0SB.
Sharp Kabushiki Kaisha: *See—*
Sato, Takefumi, 4,123,118, Cl. 303-119.000.
Tanimoto, Akira; Katoh, Sanao; and Yoshida, Yukihiro, 4,122,786, Cl. 112-158.00E.
Sharpe, Robert L., to Dana Corporation. Piston ring assembly and method of making same. 4,123,072, Cl. 277-216.000.
Shatavsky, Rubin. Magnetic tape storage and transport cartridge and mechanisms therefor. 4,123,789, Cl. 360-96.000.
Shaw, Jack, to Platt Saco Lowell Limited. Coated pinned roller. 4,122,656, Cl. 57-58.910.
Sheldon, Roger A.; and Been, Peter, to Shell Oil Company. Preparation of esters. 4,123,451, Cl. 260-465.00D.
Shell Oil Company: *See—*
Armstrong, Warren E.; La France, Donald S.; and Voge, Hervey H., 4,122,671, Cl. 60-218.000.
Scheuerman, Ronald F.; Richardson, Edwin A.; and Templeton, Charles C., 4,122,896, Cl. 166-250.000.
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Shen, Kelvin K.; and Belles, Wayne S., to United States Borax & Chemical Corporation. o-Amidophenylmorpholine compounds and method of use. 4,123,251, Cl. 71-88.000.
Sherlock, Margaret H., to Schering Corporation. 2-Cyano-5-(substituted triphenylmethyl) pyridines. 4,123,433, Cl. 260-294.900.
Sherman, John D.; and Ross, Ronald J., to Union Carbide Corporation. Zeolite agglomerates having controlled pore structure. 4,123,390, Cl. 252-455.00Z.
Sherman, Michael I., to Kamyr, Inc. Three-vessel treatment system. 4,123,318, Cl. 162-19.000.
Sherritt Gordon Mines Limited: *See—*
Sefton, Verner B.; and Kofluk, Russell P., 4,123,260, Cl. 75-117.000.
Shettel, Don L., to AMSTED Industries Incorporated. Liquid treating apparatus. 4,123,345, Cl. 204-275.000.
Shibano, Yoshizo; Saito, Tamao; and Saikawa, Toshiaki, to Sumitomo Electric Industries, Ltd. Disc antenna. 4,123,758, Cl. 343-830.000.
Shichida, Hiromichi; Gamo, Gotaro; Nomura, Yoshiyuki; Hattori, Kiyoshi; and Koiwai, Yutaka, to Fujitsu Fanuc Limited. Numerically controlled wire-cutting electric discharge machine. 4,123,645, Cl. 219-69.00W.
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, to Sumitomo Chemical Company, Limited. Catalysts for polymerization of olefins. 4,123,387, Cl. 252-429.00B.
Shigematsu, Yoshikatsu: *See—*
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.
Shih, James Y., to Powers Regulator Company. Controller for environmental conditioning apparatus. 4,123,796, Cl. 364-900.000.
Shiho, Eiji: *See—*
Ichiki, Tadaharu; Shiho, Eiji; and Kitagawa, Koji, 4,123,325, Cl. 176-38.000.
Shiina, Osamu: *See—*
Yukishita, Tuyoshi, 4,123,006, Cl. 239-266.000.
Shimazu, Shinichi: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.
Shimizu, Masayuki: *See—*
Kita, Shinichiro; Hiki, Fumihiko; Shimizu, Masayuki; and Kondou, Akira, 4,123,600, Cl. 526-65.000.
Shimizu, Syogo; Ochiai, Toshihiko; and Sakai, Masato, to Tokyo Shibaura Electric Co., Ltd. Rotor-shaft assembly. 4,123,199, Cl. 416-244.00A.
Shimonishi, Yasutsugu: *See—*
Ishimaru, Toshiyasu; Shimonishi, Yasutsugu; Sakurai, Hisayuki; and Hatanaka, Minoru, 4,123,611, Cl. 542-421.000.
Shin Meiwa Industry Co., Ltd.: *See—*
Mochizuki, Taketoshi; Harada, Fumio; Imaizumi, Tadahiro; and Nose, Koichi, 4,122,688, Cl. 62-196.00R.
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Shin'Etsu Kasei Kabushiki Kaisha: *See—*
Saito, Shoji, 4,123,487, Cl. 264-90.000.
Shingu, Tamotsu: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.
Shinoda, Nobuhiko: *See—*
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.
Shinsho, Toshihiro: *See—*
Fushida, Akira; Morikawa, Hiroichi; Shinsho, Toshihiro; Miyazaki, Takaaki; and Aizawa, Tatsuo, 4,123,271, Cl. 96-1.800.
Shionogi & Co., Ltd.: *See—*
Yamamoto, Masao; and Iwanaga, Sumio, 4,123,352, Cl. 209-546.000.
Shiraishi, Satoshi: *See—*
Nakahara, Tsuneo; Hoshikawa, Masao; Shiraishi, Satoshi; Kurosaki, Shiro; and Fujiwara, Kunio, 4,123,483, Cl. 264-1.000.
Shiraishi, Tadayoshi: *See—*
Tanaka, Tsutomu; Nakamura, Yoshio; Asahi, Koji; Shiraishi, Tadayoshi; and Takahara, Kenji, 4,123,329, Cl. 195-28.00R.
Shiroma, Dallas M.: *See—*
Paszyc, Aleksy J.; Shiroma, Dallas M.; and Huang, Kwang T., 4,123,697, Cl. 322-2.00A.

Shono, Tetsuji: *See*—
Uno, Naoyuki; Shono, Tetsuji; Urano, Fumio; and Kawasaki, Masahiro, 4,123,764, Cl. 354-24.000.

Short, Edward H., III: *See*—
Wood, Loren E.; Witten, John E.; and Short, Edward H., III, 4,122,595, Cl. 29-424.000.

Shoup, Leo E. Contact lens insertion and retraction device. 4,123,098, Cl. 294-1.0CA.

Shuck, Robert E.: *See*—
Lancto, Donald C.; and Shuck, Robert E., 4,123,747, Cl. 340-149.00A.

Shulzhenko, Alexandr A.; and Getman, Anatoly F. Method of making diamonds synthetically. 4,123,504, Cl. 423-446.000.

Shuster, Edward J.: *See*—
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.

Sidlaw Industries Limited: *See*—
Queen, David S.; Bell, Peter W.; Dick, Thomas H.; and Edgar, John B., 4,123,313, Cl. 156-498.000.

Sieber, Peter: *See*—
Frei, Roland; Gutmann, Franz; Sieber, Peter; and Koeppel, Peter, 4,123,228, Cl. 422-274.000.

Siemens Aktiengesellschaft: *See*—
Franetzki, Manfred; Korn, Volker; and Prestele, Karl, 4,122,839, Cl. 128-2.080.
Lampert, Ernst; and Mahner, Helmut, 4,123,718, Cl. 325-474.000.
Lange, Gerhard; and Peche, Gerhard, 4,123,682, Cl. 313-54.000.
Reiss, Karl-Hans; and Killig, Klaus, 4,123,654, Cl. 250-272.000.
Rohrich, Heinz, 4,122,967, Cl. 220-2.30R.
Schucht, Peter, 4,123,726, Cl. 331-14.000.
Weiss, Karl; and Rost, Helmut, 4,122,587, Cl. 128-134.000.

Siemens-Allis, Inc.: *See*—
Lott, Donald L.; Schockelt, Guenter G.; and Worrix, Matthew L., 4,123,637, Cl. 200-148.00A.

Sifniades, Stylianos; Tunick, Allen A.; and Wohlers, Herbert C., to Allied Chemical Corporation. Synthesis of metal alkyl carbonates. 4,123,446, Cl. 260-439.00R.

Sigloch and Schrieder: *See*—
Braun, Erwin, 4,123,191, Cl. 408-42.000.

Silver, Jules; and Silverstein, Jerome, to Silver, Jules. Valved two compartment dispensing container. 4,122,943, Cl. 206-221.000.

Silverman, Ronald: *See*—
Joshi, Madhukar L.; Landler, Paul F.; and Silverman, Ronald, 4,123,300, Cl. 148-187.000.

Silverstein, Jerome: *See*—
Silver, Jules; and Silverstein, Jerome, 4,122,943, Cl. 206-221.000.

Silvestrini, Jesus A., to California Processing Machinery. Apparatus for pitting fruits or drupe type. 4,122,765, Cl. 99-551.000.

Simmonds Precision Products, Inc.: *See*—
Maier, Lawrence C., 4,122,708, Cl. 73-136.00A.

Singer Company, The: *See*—
Dahab, Richard E.; and Pollack, Howard M., 4,123,136, Cl. 350-16.000.
Peets, Robert S., 4,123,124, Cl. 312-21.000.
Tambor, Ronald, 4,123,164, Cl. 356-152.000.

Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 4-Nitro-4-isocyanato- or amino-diphenyl ethers. 4,123,449, Cl. 260-453.0AR.

Sirrenberg, Wilhelm: *See*—
Colin, Reimer; and Sirrenberg, Wilhelm, 4,123,478, Cl. 260-986.000.

Sitton, Donald M.; and Terry, Ronald E., to Phillips Petroleum Company. Correlation of weighted effect of different ions and surfactant composition for surfactant flood. 4,122,895, Cl. 166-252.000.

Sixtensson, Par S.: *See*—
Moren, Karl-Erik; and Sixtensson, Par S., 4,123,261, Cl. 75-125.000.

SKF Industrial Trading & Development Company B.V.: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,123,121, Cl. 308-6.00C.

Skimovex B.V.: *See*—
Middelbeek, Cornelis G., 4,123,365, Cl. 210-521.000.

Skorianetz, Werner; Dastur, Khurshid P.; and Strickler, Hugo, to Firmenich SA. Tricyclo[5.2.1.$0^{2,6}$]decane-methylol or its lower alkyl or alkenyl ester or ether derivatives in perfume compositions. 4,123,394, Cl. 252-522.000.

Skrzypczyk, William G.: *See*—
Dammel, Howard W.; Frantz, Robert M.; Luke, James H.; and Skrzypczyk, William G., 4,123,642, Cl. 219-10.590.

Slate, Robert C. Air-heater type fireplace grate. 4,122,825, Cl. 126-121.000.

Slater, John R., to Loew's Theatres, Inc. Elevated tray display device. 4,122,954, Cl. 211-133.000.

Slingerland Drum Co.: *See*—
Hoellerich, John L., 4,122,749, Cl. 84-419.000.

Smith, Bob R.; West, Harold L.; Bray, Thomas L.; and Wilder, Robert H., Sr. Ring type debarker. 4,122,877, Cl. 144-208.00E.

Smith, Brian P. Fish attractor. 4,122,624, Cl. 43-42.330.

Smith, John D. Water purifying system and pump therefor. 4,123,359, Cl. 210-169.000.

Smith, Michael R., to Spectra-Med. Infrared laser photocautery device. 4,122,853, Cl. 128-303.100.

Smith & Nephew Research Limited: *See*—
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,123,416, Cl. 260-42.180.

Smith, Robert L.; Stokker, Gerald E.; and Gragoe, Edward J., Jr., to Merck & Co., Inc. 2-Halo-4-aminomethyl-6-alkyl-3-pyridinols useful as diuretics in treating hypertension and edema. 4,123,537, Cl. 424-263.000.

Smith, Theodore M., to Theodore M. Smith Trust, Lucille G. Smith & Theodore M. Smith, Trustees. Torque clutch coupling. 4,122,928, Cl. 192-56.00R.

Smith, William E., to General Electric Company. 2-Alkoxy-tetrahydrofurans via hydroformylation of allylic alcohols. 4,123,444, Cl. 260-347.800.

Smiths Industries Limited: *See*—
Beardmore, Geoffrey, 4,122,689, Cl. 64-15.00B.

Smitka, Gunter. Duct joint assembly. 4,123,094, Cl. 285-405.000.

Snow, James V.: *See*—
Darragh, Donald R., 4,123,025, Cl. 248-303.000.

Snyder, Dennis L.; Stayer, Mark L., Jr.; and Kang, Jung W., to Firestone Tire & Rubber Company, The. Catalysis of phosphazene cyclics to polymer, using Lewis acid compounds. 4,123,503, Cl. 423-300.000.

Sochol, Irving: *See*—
Welsh, Jay Y.; and Sochol, Irving, 4,123,499, Cl. 423-35.000.

Societa Farmaceutici Italia S.p.A.: *See*—
Bernardi, Luigi; Elli, Carlo; Falconi, Giovanni B.; and Ferrari, Rosella, 4,123,613, Cl. 544-408.000.

S.A. dite Compagnie Generale de Chauffe: *See*—
Delaporte, Jean-Charlemagne, 4,122,892, Cl. 165-12.000.

Societe Anonyme dite: Weber et Broutin: *See*—
Krzeszowski, Thaddee, 4,123,305, Cl. 156-71.000.

S.A. Etablissements Francois Salomon & Fils: *See*—
Riedel, Tilo, 4,123,083, Cl. 280-605.000.

Societe Chimique des Charbonnages: *See*—
Milette, Henri, 4,123,414, Cl. 260-38.000.

Societe d'Etudes de Machines Thermiques: *See*—
Charron, Francis, 4,122,679, Cl. 60-599.000.

Societe Moritz: *See*—
Armanet, Pierre, 4,123,801, Cl. 366-292.000.

Societe Soberal S.A.: *See*—
Nieto de Moreno, Pierre A., 4,122,934, Cl. 193-32.000.

Soffer, Michael J.; and Schneider, Richard S., to Syva Company. Non-oxo-carbonyl containing benzoyl ecgonine and cocaine compounds and derivatives thereof. 4,123,431, Cl. 260-292.000.

Solv-X Inventions Ltd.: *See*—
Lee, Edward, 4,122,861, Cl. 134-109.000.

Soma, Tsunenori: *See*—
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.

Sonoco Products Company: *See*—
Rowe, E. Riley; Fletcher, Wade; Markert, Herman R.; and Grady, Dwight D., 4,122,790, Cl. 113-120.00R.

Sony Corporation: *See*—
Ohsawa, Mitsuo, 4,123,714, Cl. 325-455.000.

Sorensen, Phillips N., to Park-Ohio Industries, Inc. Device for inductively heating cylindrical surfaces. 4,123,644, Cl. 219-10.570.

Sorokin, Andrei N.: *See*—
Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I., 4,123,735, Cl. 336-30.000.

Sorrentino, Anthony. Support frame and pool cover. 4,122,562, Cl. 4-172.120.

Southwire Company: *See*—
Brewton, Lee K., 4,123,584, Cl. 428-379.000.
Richards, Roy, 4,122,889, Cl. 164-87.000.

Spanke, Edwin A.; Carrieri, Louis F.; and Francey, Melvin H., to Gulf & Western Manufacturing Company. Fluid operated clutch and brake. 4,122,926, Cl. 192-18.00A.

Sparks, Charles H., deceased (by Sparks, Margaret J., executrix), to Sparks, Margaret J. Method of making a compliant mandrel in a mandrel assembly for growing graft tubes. 4,123,486, Cl. 264-46.600.

Sparks, Margaret J.: *See*—
Sparks, Charles H., deceased, 4,123,486, Cl. 264-46.600.

Sparks, Margaret J., executrix: *See*—
Sparks, Charles H., deceased, 4,123,486, Cl. 264-46.600.

Sparzak, Walter J.; and Vesperman, William C., to Western Electric Company, Inc. Polymeric composition comprising a halide polymer, an ethylene terpolymer and an alkyl acrylate copolymer. 4,123,585, Cl. 428-379.000.

Spectra-Med: *See*—
Smith, Michael R., 4,122,853, Cl. 128-303.100.

Speidel, Gerald M.: *See*—
Vass, George S.; and Speidel, Gerald M., 4,122,681, Cl. 405-261.000.

Speizman Industries, Inc.: *See*—
Moreni, Battista, 4,122,690, Cl. 66-14.000.

Spencer, Arthur T.: *See*—
Hardy, Paul R.; and Spencer, Arthur T., 4,123,132, Cl. 339-246.000.

Spencer, Lloyd. Means and method of installing emitters in irrigation tubing. 4,122,590, Cl. 29-157.00C.

Sperry Rand Corporation: *See*—
Fleming, David L.; Johansen, Thomas R.; and Torok, Ernest J., 4,123,142, Cl. 350-162.0SF.
Johnson, Kenneth C., 4,123,704, Cl. 324-78.00Z.

Speth, Sebastian: *See—*
Giesen, Heinz; Hibbel, Josef; Jansen, Willi; and Speth, Sebastian, 4,123,235, Cl. 55-85.000.

Spetzler, Edgar: *See—*
Klapdar, Wilhelm; Richter, Helmut; Rommerswinkel, Heinrich-Wilhelm; Spetzler, Edgar; and Wendorff, Jochen, 4,123,258, Cl. 75-58.000.

Spevack, Jerome S., to Deuterium Corporation. Utilization of impure steam contaminated with hydrogen sulfide. 4,123,506, Cl. 423-566.000.

Sphere Investments Limited: *See—*
Richards, Arthur W., 4,122,952, Cl. 209-579.000.

Spieth, Wolfgang: *See—*
Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, 4,123,694, Cl. 318-443.000.

Sprecker, Mark A., to International Flavors & Fragrances Inc. Process for production of bicyclic compounds. 4,123,469, Cl. 260-668.00F.

Sprecker, Mark A.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.

Springrose, B. Steven: *See—*
Cosentino, Louis C.; and Springrose, B. Steven, 4,123,091, Cl. 285-39.000.

SRI International: *See—*
Robinson, Lloyd A., 4,123,703, Cl. 324-58.50B.

Staab, Robert A.: *See—*
Maguire, Edward J., Jr.; and Staab, Robert A., 4,123,395, Cl. 252-559.000.

Stacey, Gilbert J.: *See—*
Dutta, Anand S.; Gormley, James J.; Hayward, Christopher F.; Morley, John S.; Petter, Nigel N.; and Stacey, Gilbert J., 4,123,523, Cl. 424-177.000.

Stager, Phyllis H. Disposable cosmetic glove. 4,122,554, Cl. 2-164.000.

Stagg, Charles M.: *See—*
Tribble, Ronald L.; and Stagg, Charles M., 4,123,519, Cl. 424-88.000.

Stahl, Philip: *See—*
Moskowitz, Ronald; Stahl, Philip; and Reed, Walter R., 4,123,675, Cl. 310-49.00R.

Staley, Lester K.: *See—*
Hopwood, Francis W.; and Staley, Lester K., 4,123,719, Cl. 328-155.000.

Stamicarbon, B.V.: *See—*
Geurts, Leonardus H.; and Meijer, Peter J. N., 4,123,438, Cl. 260-326.5FN.

Stampfli, Jean-Marcel, to Ebauches Electroniques S.A. Electronic watch. 4,122,664, Cl. 58-88.00B.

Standard Oil Company, The: *See—*
Grasselli, Robert K.; Miller, Arthur F.; and Hardman, Harley F., 4,123,453, Cl. 260-465.300.

Standard Oil Company (Indiana): *See—*
Port, Morton I.; Nebe, Juergen; and Ladeur, Bernhard H., 4,123,577, Cl. 428-95.000.

Stanton, Leo F., to Bush Universal, Inc. Apparatus for stiffening shoe insoles. 4,122,573, Cl. 12-18.300.

Starbuck, Christopher P.: *See—*
Botcherby, Stephen C. L.; and Starbuck, Christopher P., 4,123,145, Cl. 350-269.000.
Botcherby, Stephen C. L.; Starbuck, Christopher P.; and Fitzherbert, Jeremy A., 4,123,166, Cl. 356-152.000.

Starzyk, Eugene J. Feeder transfer chute. 4,122,933, Cl. 193-32.000.

Stasz, Peter; and Patten, Floyd R., to Medtronic, Inc. Liquid velocity measuring system. 4,122,713, Cl. 73-194.00A.

Stauffer Chemical Company: *See—*
Campbell, Ramsey G.; Doane, Elliott P.; Heines, M. Henry; Naworski, Joseph S.; and Vogt, Harvey J., 4,123,467, Cl. 260-659.00A.
Large, George B.; and Pitt, Leland S., 4,123,526, Cl. 424-200.000.

Stayer, Mark L., Jr.: *See—*
Snyder, Dennis L.; Stayer, Mark L., Jr.; and Kang, Jung W., 4,123,503, Cl. 423-300.000.

Steadley Company, Inc.: *See—*
Yates, Chester R., 4,122,566, Cl. 5-260.000.

Stedman, Robert N., to Caterpillar Tractor Co. Backhoe with multi-movement capabilities. 4,122,959, Cl. 314-138.00R.

Stedman, Robert N., to Caterpillar Tractor Co. Track shoe with clamping means. 4,123,119, Cl. 305-39.000.

Steeb, Walter: *See—*
Andrei-Alexandru, Marcel; Gille, Gunther; Goertler, Horst; Prohaska, Hans; Steeb, Walter; and Spieth, Wolfgang, 4,123,694, Cl. 318-443.000.

Steel Company of Canada, Limited, The: *See—*
Hunter, Robert F., 4,122,823, Cl. 126-117.000.

Steenhof de Jong, Jacob G.: *See—*
Klaver, Petrus; and Steenhof de Jong, Jacob G., 4,123,208, Cl. 425-72.00S.

Stehlin, Theodore A., to Hansted Corporation. Pipe clamp having an overcenter toggle. 4,123,095, Cl. 285-409.000.

Stein, Gunter: *See—*
Barnert, Konrad; and Stein, Gunter, 4,122,813, Cl. 123-139.0ST.

Steinbrink, Rainer: *See—*
Bockelmann, Wilfried; and Steinbrink, Rainer, 4,122,806, Cl. 123-103.00R.

Stemp, Leslie W. Silencer. 4,122,913, Cl. 181-256.000.

Stendel, Wilhelm: *See—*
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,123,449, Cl. 260-453.0AR.

Sterling, Robert H. Golf club and jig for making same. 4,123,060, Cl. 273-167.00R.

Sterndent Corporation: *See—*
French, Park, 4,123,172, Cl. 356-188.000.

Stevens, Joe M.; and Porter, Elmer D., to Essex Group, Inc. Switch-valve assembly having rotatable operating mechanism with latch. 4,123,633, Cl. 200-61.860.

Stewart, Clare A., Jr., to Du Pont de Nemours, E. I., and Company. Fluoroelastomer composition. 4,123,603, Cl. 526-254.000.

Stice, Eldon C. Adjustable gun stock. 4,122,623, Cl. 42-73.000.

Stich, Frederick A.: *See—*
Gilmore, Thomas P.; and Stich, Frederick A., 4,123,692, Cl. 318-227.000.

Stinehelfer, Harold E., Sr.: *See—*
Hines, Marion E.; Stinehelfer, Harold E., Sr.; and Atchley, Dana W., Jr., 4,123,759, Cl. 343-854.000.

Stokker, Gerald E.: *See—*
Smith, Robert L.; Stokker, Gerald E.; and Gragoe, Edward J., Jr., 4,123,537, Cl. 424-263.000.

Stone, Fred T., to Olinkraft, Inc. Water control system including a pressure roll for suction rolls in papermaking machines. 4,123,320, Cl. 162-199.000.

Stora Kopparbergs Bergslags AB: *See—*
Moren, Karl-Erik; and Sixtensson, Par S., 4,123,261, Cl. 75-125.000.

Storace, Anthony; and Sette, Paul R., to Pitney-Bowes, Inc. Load coupling device. 4,122,906, Cl. 177-213.000.

Stoudt, Thomas H.: *See—*
Hagopian, Arpi; Carlo, Dennis J.; and Stoudt, Thomas H., 4,123,520, Cl. 424-92.000.

Stouffer, Ronald D.; and Bray, Harry C., Jr., to Bowles Fluidics Corporation. Personal care spray device. 4,122,845, Cl. 128-66.000.

Stoy, Artur; and Urbanova, Renata, to Ceskoslovenska akademie ved. Method of preparing shaped articles from cross-linked hydrogels. 4,123,406, Cl. 260-29.6AN.

Strasser, Michael: *See—*
Hasspacher, Klaus; and Strasser, Michael, 4,123,545, Cl. 424-274.000.

Strauts, Eric J.; and Flaherty, John J., to Magnaflux Corporation. Flying spot pattern storage system. 4,123,797, Cl. 365-118.000.

Strickler, Hugo: *See—*
Skorianetz, Werner; Dastur, Khurshid P.; and Strickler, Hugo, 4,123,394, Cl. 252-522.000.

Strikemaster Manufacturing Corp., The: *See—*
Murray, George G., 4,123,057, Cl. 273-82.00R.

Stringer, James A.; and Watson, David, to Associated Portland Cement Manufacturers Limited, The. Calcination. 4,123,288, Cl. 106-100.000.

Strobel, William C. Scaffolding. 4,122,916, Cl. 182-82.000.

Strom, Ulf J. G.: *See—*
Merilainen, Heikki; and Strom, Ulf J. G., 4,123,169, Cl. 356-167.000.

Strunc, Gerald R., to Pako Corporation. Print and order totalizer for automatic photographic paper cutter. 4,123,649, Cl. 235-92.0PD.

Stuart, Richard L.; and Bhopale, Arvind M., to Rixon, Inc. Partial response QAM modem. 4,123,710, Cl. 325-38.00A.

Stuart, Robert W.: *See—*
Leney, David E.; Stuart, Robert W.; and Anderegg, John S., 4,123,750, Cl. 340-347.00P.

Stuber, Fred A.: *See—*
Lin, Chung-Yuan; Stuber, Fred A.; and Ulrich, Henri, 4,123,466, Cl. 260-645.000.

Studiengesellschaft Kohle mbH: *See—*
Vitzthum, Otto; and Hubert, Peter, 4,123,559, Cl. 426-312.000.

Suda, Yoshitaka: *See—*
Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, 4,123,554, Cl. 424-324.000.

Sugawara, Tsutomu, to Tokyo Shibaura Electric Co., Ltd. Transistor amplifier circuit. 4,123,723, Cl. 330-311.000.

Sugimoto, Yoshikazu; Yusa, Hideo; Kato, Yomei; Kamiya, Kunio; and Kikuchi, Makoto, to Hitachi, Ltd. Filter cleaning method and filter system. 4,123,356, Cl. 210-67.000.

Sugimura, Yukio: *See—*
Iwasaki, Tetsuji; Miyamoto, Norioki; Sugimura, Yukio; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,123,254, Cl. 71-98.000.

Sugisaki, Toshihiko; Horiuchi, Tetsuo; Ogasawara, Hideo; Yamanari, Shozo; and Tominaga, Kenji, to Hitachi, Ltd. Fuel assembly for a nuclear reactor. 4,123,327, Cl. 176-76.000.

Sulzer Brothers Limited: *See—*
Gnieser, Jurgen; and Pelloni, Luciano, 4,123,341, Cl. 204-152.000.
Mandrin, Charles, 4,123,508, Cl. 423-580.000.
Pfarrwaller, Erwin; and Seifert, Eberhard, 4,122,873, Cl. 139-110.000.

Sumi, Masao: *See—*
Imoto, Katsuyuki; Takasaki, Yoshitaka; and Sumi, Masao, 4,123,242, Cl. 65-11.00W.

Sumida, Seizo: *See—*
Yoshida, Ryo; Takemoto, Ichiki; Sumida, Seizo; and Kamoshita, Katsuzo, 4,123,256, Cl. 71-105.000.

Sumitomo Chemical Company, Limited: *See—*
Kameda, Nobuyuki; Hisada, Yoshio; Takayama, Chiyozo; Kato, Toshiro; and Fujinami, Akira, 4,123,549, Cl. 424-274.000.
Kita, Shinichiro; Hiki, Fumihiko; Shimizu, Masayuki; and Kondou, Akira, 4,123,600, Cl. 526-65.000.
Oyamada, Takeo; Satoh, Kazuhisa; Tomizawa, Choji; and Ishihara, Takamasa, 4,123,405, Cl. 260-29.60R.
Shiga, Akinobu; Fukui, Yoshiharu; Matsumura, Kazuhiro; Sasaki, Toshio; and Ohkawa, Masahisa, 4,123,387, Cl. 252-429.00B.
Yoshida, Ryo; Takemoto, Ichiki; Sumida, Seizo; and Kamoshita, Katsuzo, 4,123,256, Cl. 71-105.000.

Sumitomo Electric Industries, Ltd.: *See—*
Nakahara, Tsuneo; Hoshikawa, Masao; Shiraishi, Satoshi; Kurosaki, Shiro; and Fujiwara, Kunio, 4,123,483, Cl. 264-1.000.
Shibano, Yoshizo; Saito, Tamao; and Saikawa, Toshiaki, 4,123,758, Cl. 343-830.000.

Sumitomo, Yasusuke; and Ohashi, Yoshie, to Tokyo Shibaura Electric Co., Ltd. Method of manufacturing semiconductor devices. 4,123,565, Cl. 427-88.000.

Summerton, James E.; and Bartlett, Paul A., to United States of America, Government. Nucleic acid crosslinking agent and affinity inactivation of nucleic acids therewith. 4,123,610, Cl. 536-28.000.

Sun Electric Corporation: *See—*
Comiskey, Gary F.; Hesse, Gregory N.; and Bovenlander, Johannes P., 4,123,674, Cl. 307-351.000.

Sun Ventures, Inc.: *See—*
Lyons, James E., 4,123,445, Cl. 260-348.120.

Sundin, George H., to Conwed Corporation. Apparatus and method for joining webs on the fly. 4,123,314, Cl. 156-505.000.

Sunkist Growers, Inc.: *See—*
Varon, Miquel A.; and Paddock, Paul F., 4,123,310, Cl. 156-351.000.

Suroff, Leonard W.: *See—*
Kolt, Stanley, 4,123,001, Cl. 236-49.000.

Sutch, Brian L. C., to Airfix Industries Limited. Containers. 4,123,214, Cl. 425-129.00R.

Suyama, Eizo, to Nihon Radiator Co., Ltd. Muffler. 4,122,914, Cl. 181-258.000.

Suzuki, Hideyo: *See—*
Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, 4,123,257, Cl. 75-40.000.

Suzuki, Katumi. Submersible body warmer apparatus. 4,122,826, Cl. 126-208.000.

Swanson, Williard: *See—*
Viero, Laurence; Cannon, John; Rademaker, George; Swanson, Williard; and Fessett, Kenneth, 4,123,089, Cl. 285-39.000.

SWS Silicones Corporation: *See—*
Getson, J. Charles; and Adams, Patrick J., 4,123,472, Cl. 260-827.000.

Syntex (U.S.A.) Inc.: *See—*
Rammler, David H., 4,123,614, Cl. 560-254.000.
Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, 4,123,550, Cl. 424-275.000.
Walker, Keith A. M., 4,123,542, Cl. 424-273.00R.

Syva Company: *See—*
Soffer, Michael J.; and Schneider, Richard S., 4,123,431, Cl. 260-292.000.

Sziklas, Edward A., to United Technologies Corporation. Stable resonators for radial flow lasers. 4,123,150, Cl. 350-294.000.

Szwarc, Anthony F.: *See—*
Chace, Howard E.; and Szwarc, Anthony F., 4,123,163, Cl. 356-124.000.

Szydlo, Nicolas: *See—*
Poirier, Raymond; and Szydlo, Nicolas, 4,123,687, Cl. 313-484.000.

Tabata, Norikazu: *See—*
Yamamura, Takashi; Tabata, Norikazu; and Yamamoto, Yoshihiko, 4,123,664, Cl. 250-536.000.

Tabeta, Yataro: *See—*
Katayama, Masao; and Tabeta, Yataro, 4,123,426, Cl. 260-112.00R.

Tachibana, Kyozaburo: *See—*
Iwasaki, Tetsuji; Miyamoto, Norioki; Sugimura, Yukio; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,123,254, Cl. 71-98.000.

Taggart, George W.: *See—*
Bond, Desmond H.; Taggart, George W.; and Jaeger, Kurt S., 4,123,220, Cl. 431-353.000.

Taguchi, Kazunori. Sound absorbing and diffusing unit, an acoustic screen and/or a partition. 4,122,915, Cl. 181-284.000.

Taguchi, Makio: *See—*
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.

Takahara, Kenji: *See—*
Tanaka, Tsutomu; Nakamura, Yoshio; Asahi, Koji; Shiraishi, Tadayoshi; and Takahara, Kenji, 4,123,329, Cl. 195-28.00R.

Takahashi, Jiro; and Miyamoto, Akihiko, to Konishiroku Photo Industry Co., Ltd. Color diffusion transfer process using benzyl alcohol and derivatives thereof. 4,123,330, Cl. 96-29.00D.

Takahashi, Kentaro; and Urano, Shigeru, to Nippon Piston Ring Co., Ltd. Method of producing ferrous sintered alloy of improved wear resistance. 4,123,265, Cl. 75-211.000.

Takahashi, Tohru, to Hope Co., Ltd. Ski boot toe binding. 4,123,084, Cl. 280-630.000.

Takano, Yuuichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation apparatus for an internal combustion engine. 4,122,812, Cl. 123-119.00A.

Takaoki, Kiyoshi: *See—*
Ajima, Takashi; Takaoki, Kiyoshi; and Yonezawa, Toshio, 4,123,564, Cl. 427-85.000.

Takasaki, Yoshitaka: *See—*
Imoto, Katsuyuki; Takasaki, Yoshitaka; and Sumi, Masao, 4,123,242, Cl. 65-11.00W.

Takayama, Chiyozo: *See—*
Kameda, Nobuyuki; Hisada, Yoshio; Takayama, Chiyozo; Kato, Toshiro; and Fujinami, Akira, 4,123,549, Cl. 424-274.000.

Takeda, Toshio: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,122,743, Cl. 84-1.240.

Takemoto, Ichiki: *See—*
Yoshida, Ryo; Takemoto, Ichiki; Sumida, Seizo; and Kamoshita, Katsuzo, 4,123,256, Cl. 71-105.000.

Takeno, Tsuneyuki: *See—*
Iwasaki, Tetsuji; Miyamoto, Norioki; Sugimura, Yukio; Tachibana, Kyozaburo; and Takeno, Tsuneyuki, 4,123,254, Cl. 71-98.000.

Takeuchi, Koji; and Inagaki, Syotaro, to Minolta Camera Kabushiki Kaisha. Toner dispensing device having reciprocating dispensing plate and agitator. 4,122,981, Cl. 222-231.000.

Takeuchi, Shinjiro: *See—*
Fujii, Yoshihiro; Moriyama, Taketoshi; Shigematsu, Yoshikatsu; Takeuchi, Shinjiro; Kikuchi, Toshiro; Taguchi, Makio; and Ichioka, Satoshi, 4,123,707, Cl. 324-208.000.

Takigawa, Hiroyoshi; Watanabe, Shigeo; Aoki, Shigeta; and Ogawa, Hiroshi, to Bridgestone Tire Company Limited. Heavy duty pneumatic radial tire. 4,122,879, Cl. 152-209.00R.

Tamazina, Valentina Nikolaevna: *See—*
Kononenko, Viktor Evmenievich; Tamazina, Valentina Nikolaevna; and Ozerova, Alla Ivanovna, 4,123,568, Cl. 427-126.000.

Tambor, Ronald, to Singer Company, The. Autocollimating assembly for the self-calibration of a stellar navigational system. 4,123,164, Cl. 356-152.000.

Tammen, Heinrich: *See—*
Kramann, Bernhard; and Tammen, Heinrich, 4,122,591, Cl. 29-157.00R.

Tanaka, Mamoru, to Bridgestone Tire Company Limited. Leakage preventive mechanism for flexible hoses. 4,123,088, Cl. 285-14.000.

Tanaka, Taro: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,122,802, Cl. 123-3.000.

Tanaka, Tsutomu; Nakamura, Yoshio; Asahi, Koji; Shiraishi, Tadayoshi; and Takahara, Kenji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for producing L-lysine by fermentation. 4,123,329, Cl. 195-28.00R.

Tanaka, Yoshio: *See—*
Fukuoka, Hiroshi; Kameyama, Teruhiko; Tanaka, Yoshio; Suzuki, Hideyo; and Imai, Kimiaki, 4,123,257, Cl. 75-40.000.

Tang, Man-Chung, to Dyckerhoff & Widmann Aktiengesellschaft. Stage construction of an elevated box girder and roadway structure. 4,123,485, Cl. 264-33.000.

Taniguchi, Yoshio: *See—*
Hirabayashi, Masaya; Kawahara, Haruyuki; and Taniguchi, Yoshio, 4,122,605, Cl. 32-10.00A.

Tanimoto, Akira; Katoh, Sanao; and Yoshida, Yukihiro, to Sharp Kabushiki Kaisha. Programmable stitch pattern forming control in an electronic sewing machine. 4,122,786, Cl. 112-158.00E.

Tardy, Maurice; and Paulet, Jean, to Bennes Marrel. Selective and proportional hydraulic remote control device, in particular for handling and public work gears. 4,122,864, Cl. 137-625.600.

Tasaki, Yoshio; Nakayama, Noboru; and Kajihara, Hiroshi, to Agency of Industrial Science & Technology. Portable frictional welding device. 4,122,990, Cl. 228-2.000.

Tassin de Montaigu, Rene C. A. Helicopters with coaxial rotors, of convertible type in particular. 4,123,018, Cl. 244-17.230.

Tauscher, Manfred: *See—*
Credner, Karl; Brenner, Gunter; Tauscher, Manfred; and Jozic, Ljerka, 4,123,534, Cl. 424-253.000.

Tavernier, Bernard H.: *See—*
Gilliams, Yvan K.; De Volder, Noel J.; De Winter, Walter F.; and Tavernier, Bernard H., 4,123,374, Cl. 252-62.10L.

Taylor, David W.: *See—*
Kohler, Dale M.; Dahlstrom, Norris A.; and Taylor, David W., 4,123,298, Cl. 148-111.000.

Taylor, Phillip A.: *See—*
Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., 4,123,309, Cl. 156-234.000.
Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., 4,123,578, Cl. 428-206.000.

Technology Development Corporation: *See—*
MacLeod, Norman C., 4,123,622, Cl. 179-1.0UW.

Tecumseh Products Company: *See—*
Jacoby, Thomas A., 4,123,678, Cl. 310-217.000.

Tedder, Paul M., to United States of America, Army. Dynamic clamp circuits. 4,122,776, Cl. 102-214.000.

Tedford, Fred. Disposable undergarments. 4,122,552, Cl. 2-78.00R.

Teitei, Tsutomu: *See—*
Sasse, Wolfgang H. F.; and Teitei, Tsutomu, 4,123,219, Cl. 432-1.000.

Tektronix, Inc.: *See—*
Butler, Marlow Dole, 4,123,129, Cl. 312-257.00R.
Olson, Ronald Arthur, 4,123,705, Cl. 324-121.00R.

Teledyne Industries, Inc.: *See—*
Hopf, Werner G., 4,122,607, Cl. 33-174.00L.
Hopf, Werner G., 4,122,608, Cl. 33-174.00L.

Templeton, Charles C.: *See—*
Scheuerman, Ronald F.; Richardson, Edwin A.; and Templeton, Charles C., 4,122,896, Cl. 166-250.000.
Terroy, Michel-Claude: *See—*
Evrard, Paul; and Terroy, Michel-Claude, 4,123,494, Cl. 264-258.000.
Terry, John B.: *See—*
Gagnier, Real; Bourne, John B.; and Terry, John B., 4,123,624, Cl. 179-15.0AT.
Terry, Ronald E.: *See—*
Sitton, Donald M.; and Terry, Ronald E., 4,122,895, Cl. 166-252.000.
Teschner, Horst, to Ingenium Ingenieurgesellschaft fur Mehrzweckbauten, Industrieanlagen und Gelandenutzung mbH Bau-Kommanditgesellschaft. Arrangement for encasing steel concrete ceilings provided with trusses. 4,123,032, Cl. 249-29.000.
Teter, Edward C., to Quaker Oats Company, The. Toy sidewalk mechanism. 4,122,727, Cl. 74-56.000.
Texaco Inc.: *See—*
Brown, Winthrop K.; Bridges, James R.; and Savage, Kerry D., 4,122,709, Cl. 73-136.00A.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J.; and Rizzo, Salvatore P., 4,123,627, Cl. 200-5.00A.
Dean, Lura C., Jr.; Boswell, Gary T.; Winkelman, Wayne; and Little, Frank S., 4,123,795, Cl. 364-200.000.
Textron Inc.: *See—*
Runkel, Manfred A.; and Licha, Joseph, 4,122,759, Cl. 92-168.000.
Tezel. Jirayr. Cutting tool. 4,122,855, Cl. 128-310.000.
Thayer, Orla E. Piano hand truck. 4,122,958, Cl. 214-38.0CC.
Theodore M. Smith Trust: *See—*
Smith, Theodore M., 4,122,928, Cl. 192-56.00R.
Thermo Electron Corporation: *See—*
Hoult, David P., 4,123,322, Cl. 162-352.000.
Thomas, David F., Jr.; and Williams, Leon A., Jr., to United States of America, National Aeronautics and Space Administration. Fluid velocity measuring device. 4,122,712, Cl. 73-189.000.
Thomassen, Ivar P., to O'Brien Corporation, The. Curing agent for water-based epoxy resins. 4,123,402, Cl. 260-29.2EP.
Thompson, Harold R.: *See—*
Guimond, Ronald N.; and Thompson, Harold R., 4,122,978, Cl. 222-189.000.
Thompson, Jack W.: *See—*
Kellum, Gene E.; and Thompson, Jack W., 4,123,601, Cl. 526-79.000.
Thompson, Robert B., to United States of America, National Aeronautics and Space Administration. Length mode piezoelectric ultrasonic transducer for inspection of solid objects. 4,122,725, Cl. 73-632.000.
Thompson, Roger L., to American Air Filter Company, Inc. Air conditioning system. 4,122,893, Cl. 165-16.000.
Thomson-CSF: *See—*
Ploix, Jean Luc, 4,123,346, Cl. 204-299.00R.
Poirier, Raymond; and Szydlo, Nicolas, 4,123,687, Cl. 313-484.000.
Poirier, Raymond, 4,123,733, Cl. 333-70.00T.
Thurston, Kelly W.: *See—*
Kingsbury, William L.; Thurston, Kelly W.; and Chapman, Harry L., 4,122,804, Cl. 123-32.0ST.
Kingsbury, William L.; and Thurston, Kelly W., 4,122,805, Cl. 123-32.0ST.
Thyssen Niederrhein: *See—*
Klapdar, Wilhelm; Richter, Helmut; Rommerswinkel, Heinrich-Wilhelm; Spetzler, Edgar; and Wendorff, Jochen, 4,123,258, Cl. 75-58.000.
Timko, Michael P.; and Brokaw, Adrian P., to Analog Devices, Incorporated. Integrated circuit two terminal temperature transducer. 4,123,698, Cl. 323-1.000.
Titan Proform Company Limited: *See—*
Mills, Peter M., 4,123,112, Cl. 301-35.0BJ.
Titus, Hans-Joachim. Mixer. 4,123,174, Cl. 366-102.00.
Tokumitsu, Shinichi: *See—*
Kyo, Kayomon; Asai, Yasuhiko; and Tokumitsu, Shinichi, 4,123,420, Cl. 528-127.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Ichiki, Tadaharu; Shiho, Eiji; and Kitagawa, Koji, 4,123,325, Cl. 176-38.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Aihara, Mitsuo; and Ogawa, Hisaharu, 4,123,671, Cl. 307-270.000.
Ajima, Takashi; Takaoki, Kiyoshi; and Yonezawa, Toshio, 4,123,564, Cl. 427-85.000.
Horiike, Yasuhiro, 4,123,663, Cl. 250-531.000.
Matsumoto, Yoshihiro, 4,123,794, Cl. 364-101.000.
Shimizu, Syogo; Ochiai, Toshihiko; and Sakai, Masato, 4,123,199, Cl. 416-244.00A.
Sugawara, Tsutomu, 4,123,723, Cl. 330-311.000.
Sumitomo, Yasusuke; and Ohashi, Yoshie, 4,123,565, Cl. 427-88.000.
Uchida, Yukimasa, 4,123,771, Cl. 357-23.000.
Tolnai, Julius L., to Price-Pfister Brass Mfg. Co. Lever mechanism for a mixing valve. 4,122,726, Cl. 74-21.000.
Tominaga, Kenji: *See—*
Sugisaki, Toshihiko; Horiuchi, Tetsuo; Ogasawara, Hideo; Yamanari, Shozo; and Tominaga, Kenji, 4,123,327, Cl. 176-76.000.
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument with glide. 4,122,743, Cl. 84-1.240.
Tomita, Satoru; Ohori, Tamio; and Karasawa, Shuichi, to Ricoh Company, Ltd. Improved electrostatic head with toner-repelling electrode. 4,123,762, Cl. 346-155.000.
Tomizawa, Choji: *See—*
Oyamada, Takeo; Satoh, Kazuhisa; Tomizawa, Choji; and Ishihara, Takamasa, 4,123,405, Cl. 260-29.60R.
Tommasini, Raffaele: *See—*
Melloni, Piero; Della Torre, Arturo; Lauria, Francesco; Passerini, Norina; Rossi, Alessandro; and Tommasini, Raffaele, 4,123,527, Cl. 424-244.000.
Tooley, Jack R., to Acrow (Engineers) Limited. Apparatus for use in buildings. 4,122,645, Cl. 52-648.000.
Toppan Printing Co., Ltd.: *See—*
Kato, Masahiko; Katogi, Hisao; and Seki, Ikuo, 4,123,171, Cl. 356-175.000.
Toray Industries, Inc.: *See—*
Morioka, Atsumi; and Nakashima, Tamotsu, 4,122,658, Cl. 57-140.00R.
Torkildsen, Robert A.: *See—*
LaConti, Anthony B.; Torkildsen, Robert A.; and Jones, Robert C., 4,123,700, Cl. 324-29.000.
Torok, Ernest J.: *See—*
Fleming, David L.; Johansen, Thomas R.; and Torok, Ernest J., 4,123,142, Cl. 350-162.0SF.
Torrington Company, The: *See—*
Gabrielson, Alan L.; and Magazian, Harry, 4,123,122, Cl. 308-238.000.
Hickson, James P., 4,122,788, Cl. 112-222.000.
Towmotor Corporation: *See—*
Palmer, Norman H. G.; and Wiblin, Wayne T., 4,123,740, Cl. 338-67.000.
Pilarczyk, Charles E., 4,122,728, Cl. 74-103.000.
Townsend, Leroy B.; Lewis, Arthur F.; and Roti Roti, Linda W., to United States of America, Health, Education and Welfare. Synthesis of 6-amino-4-methyl-8-(β-D-ribofuranosyl)pyrrolo[4,3,2-de]-pyrimido[4,5-C]pyridazine-5'-phosphate as a novel compound and its utility against L-1210 mouse leukemia. 4,123,524, Cl. 424-180.000.
Townsend, Rodney P.: *See—*
Jones, Eric; and Townsend, Rodney P., 4,123,225, Cl. 422-98.000.
Toyo Jozo Company, Ltd.: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Mabuchi, Shunsuke; Tsuzuki, Kenji; and Kumoi, Sadakatsu, 4,123,616, Cl. 568-861.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Asano, Hiroaki; and Tsujiuchi, Toshio, 4,122,635, Cl. 51-165.710.
Nishimura, Hideo; and Niwa, Kuniyuki, 4,122,634, Cl. 51-165.710.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hattori, Kyo, 4,122,818, Cl. 123-196.0AB.
Noguchi, Masaaki; and Bunda, Tsuchio, 4,123,391, Cl. 252-466.0PT.
Sato, Akira, 4,123,069, Cl. 277-70.000.
Takano, Yuuichi, 4,122,812, Cl. 123-119.00A.
Traffic Engineers Supply Corporation (TESCO): *See—*
McReynolds, Marshall B.; and VanTilbury, Jack D., 4,122,994, Cl. 235-89.00R.
Transcience Industries, Inc.: *See—*
Davis, Manfred, 4,123,725, Cl. 331-8.000.
Traxson, Larry L.: *See—*
Bendure, Harry; and Traxson, Larry L., 4,122,731, Cl. 74-674.000.
Tribble, Ronald L.; and Stagg, Charles M., to Philips Roxane, Inc. Injectable contraceptive vaccine and method. 4,123,519, Cl. 424-88.000.
Trondle, Robert: *See—*
Link, Christoph; and Trondle, Robert, 4,123,321, Cl. 162-272.000.
TRW Inc.: *See—*
Matlock, Wallace M., 4,122,817, Cl. 123-188.0AA.
Tsacoyannis, Hedwig R. Educational game. 4,123,051, Cl. 273-1.00R.
TSB International N.V.: *See—*
Fisher, Peter M.; and Matsumiya, James A., 4,122,882, Cl. 152-381.2WC.
Tseng, Ching Y.: *See—*
Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
Tsuchimoto, Takashi, to Hitachi, Ltd. Plasma processor. 4,123,316, Cl. 156-643.000.
Tsuchiya, Kazuo; and Ohnishi, Noboru, to Yaesu Rehabili Co., Ltd. Apparatus for analyzing the balancing function of the human body. 4,122,840, Cl. 128-2.00S.
Tsuchiya, Shigeru: *See—*
Kawada, Seigo; Suda, Yoshitaka; Tsuchiya, Shigeru; Ohta, Nobuya; Muramatsu, Norimichi; and Nishio, Kazuo, 4,123,554, Cl. 424-324.000.
Tsuji, Masuo, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece digital display drive circuit. 4,122,661, Cl. 58-23.00R.
Tsujiuchi, Toshio: *See—*
Asano, Hiroaki; and Tsujiuchi, Toshio, 4,122,635, Cl. 51-165.710.
Tsuruta, Eiji: *See—*
Hosaka, Akio; and Tsuruta, Eiji, 4,122,667, Cl. 60-39.09R.
Hosaka, Akio; and Tsuruta, Eiji, 4,123,721, Cl. 330-69.000.

Tsutsui, Satoshi: *See—*
Inoue, Sho; Ohata, Katsuya; Tsutsui, Satoshi; and Nomura, Tatsuo, 4,123,541, Cl. 424-272.000.
Tsuzuki, Kenji: *See—*
Mabuchi, Shunsuke; Tsuzuki, Kenji; and Kumoi, Sadakatsu, 4,123,616, Cl. 568-861.000.
Tuggle, Richard H., Jr.: *See—*
Johnston, James D.; Tuggle, Richard H., Jr.; Burch, John L.; and Clark, Keith H., 4,122,991, Cl. 228-13.000.
Tull, Roger J.; and Melillo, David G., to Merck & Co., Inc. 2-Methyl-5-fluoro-indanol-3-acetic acid. 4,123,457, Cl. 562-466.000.
Tully, Louis E.: *See—*
McConnell, David P.; and Tully, Louis E., 4,122,757, Cl. 91-506.000.
Tunick, Allen A.: *See—*
Sifniades, Stylianos; Tunick, Allen A.; and Wohlers, Herbert C., 4,123,446, Cl. 260-439.00R.
Turner, Frank W. Peck-drilling apparatus for quill feed units. 4,123,187, Cl. 408-17.000.
Turner-Smith, Alan Robert: *See—*
Hale, Jacques A. G.; and Turner-Smith, Alan Robert, 4,123,695, Cl. 318-561.000.
Tyco Crystal Products, Inc.: *See—*
Kemper, Daryl M.; and Dick, Louis A., 4,123,680, Cl. 310-320.000.
Tyner, Clifford Alan; and Westbrook, Dean Lee. Apparatus for straightening the leads of dual in-line packages. 4,122,874, Cl. 140-147.000.
Uchida, Hiroyuki: *See—*
Isshiki, Naotsugu; Nikai, Isao; and Uchida, Hiroyuki, 4,122,680, Cl. 60-649.000.
Uchida, Yukimasa, to Tokyo Shibaura Electric Co., Ltd. Nonvolatile semiconductor memory. 4,123,771, Cl. 357-23.000.
Uchiyama, Hachiro: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.
Uchiyama, Yasuji: *See—*
Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,122,743, Cl. 84-1.240.
Uchiyama, Yasushi; and Awamura, Daikichi, to Nippon Jido Seigyo, Ltd. Apparatus for detecting defects in patterns. 4,123,170, Cl. 356-167.000.
Uehara, Yasuhiko: *See—*
Mitobe, Koichi; and Uehara, Yasuhiko, 4,123,563, Cl. 427-68.000.
Uemura, Michihiko: *See—*
Kanbara, Tohru; Uemura, Michihiko; and Yokoo, Nobuhiro, 4,123,731, Cl. 333-30.00R.
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, to Ogawa & Co., Ltd. Sublimable insecticidal compositions containing triisopropyl- or tritertiary-butyl-s-trioxane carriers. 4,123,525, Cl. 424-200.000.
Uetrecht, Dale M., to D. H. Baldwin Company. Variable frequency generator for polyphonic electronic music system. 4,122,744, Cl. 84-1.250.
Ukihashi, Hiroshi; Yamabe, Masaaki; and Miyake, Haruhisa, to Asahi Glass Company, Ltd. Terpolymers of tetrafluoroethylene, ethylene and perfluoroalkyl vinyl monomer and process for producing the same. 4,123,602, Cl. 526-206.000.
Ulrich, Henri: *See—*
Lin, Chung-Yuan; Stuber, Fred A.; and Ulrich, Henri, 4,123,466, Cl. 260-645.000.
Umeda, Shoji; and Yoshikawa, Akio, to Yamato Scale Company, Ltd. Series printer. 4,122,770, Cl. 101-93.190.
Umen, Michael J., to McNeil Laboratories, Incorporated. (2-Amino-2-oxoethoxy)acetic acid compounds, compositions and methods. 4,123,538, Cl. 424-267.000.
Unger, Stefan H.: *See—*
Untch, Karl G.; Unger, Stefan H.; and Lewis, Brian, 4,123,550, Cl. 424-275.000.
Union Carbide Corporation: *See—*
Best, Donald C., 4,123,462, Cl. 260-585.00B.
Nowlin, Thomas E.; and Martineau, Ronald A., 4,123,308, Cl. 156-272.000.
Sherman, John D.; and Ross, Ronald J., 4,123,390, Cl. 252-455.00Z.
Union Oil Company of California: *See—*
Hass, Robert H., 4,123,507, Cl. 423-573.00G.
Uniroyal, Inc.: *See—*
Karalis, Victor L., 4,122,574, Cl. 12-142.0RS.
United Kingdom of Great Britain and Northern Ireland, Ministry of Technology in Her Britannic Majesty's Government of the: *See—*
Benge, Robert J.; and Miller, Cecil H., 4,123,303, Cl. 149-17.000.
United States Borax & Chemical Corporation: *See—*
Shen, Kelvin K.; and Belles, Wayne S., 4,123,251, Cl. 71-88.000.
United States of America
Army: *See—*
Brown, David B.; Vickers, Jerry W.; and Pell, Kynric M., 4,123,165, Cl. 356-152.000.
Howell, Thomas H., 4,123,168, Cl. 356-152.000.
Tedder, Paul M., 4,122,776, Cl. 102-214.000.
Energy: *See—*
Capp, John P.; and Bissett, Larry A., 4,122,897, Cl. 166-256.000.
Government: *See—*
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Josefsen, Turi L. H.; and Veth, George J., 4,123,701, Cl. 324-30.00B.
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Takahashi, Kentaro; and Urano, Shigeru, 4,123,265, Cl. 75-211.000.
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Yokoyama, Tohei; and Urayama, Kiyoshi, 4,122,715, Cl. 73-228.000.
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Stoy, Artur; and Urbanova, Renata, 4,123,406, Cl. 260-29.6AN.
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Leclercq, Robert; Capouillet, Phileas; and Van Cauter, Albert, 4,123,244, Cl. 65-60.00C.
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Vanderzanden, Allan J.: *See*—
Moshofsky, Jerome F.; and Vanderzanden, Allan J., 4,122,819, Cl. 123-198.00D.
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Jernigan, James L.; Hughes, Richard S.; and Van Devender, Russell R., Jr., 4,123,728, Cl. 331-94.50L.
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Van Gossum, Lucien J.: *See*—
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Chapman, Charles C.; and Van Pool, Joe, 4,123,351, Cl. 208-262.000.
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Monbaliu, Marcel J.; Credner, Hans-Heinrich; Himmelmann, Wolfgang; Meier, Ernst; Benoy, Gaston J.; Van Poucke, Raphael K.; Schranz, Karl-Wilhelm; and Van Veelen, George F., 4,123,281, Cl. 96-100.00R.
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White, William R.; and Van Tighem, Gary P., 4,122,950, Cl. 209-12.000.
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McReynolds, Marshall B.; and VanTilbury, Jack D., 4,122,994, Cl. 235-89.00R.
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Altenschopfer, Theodor; and van Wageningen, Albertus, 4,123,375, Cl. 252-99.000.
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Vass, George S.; and Speidel, Gerald M., to Eastern Company, The. Mine roof support assembly. 4,122,681, Cl. 405-261.000.
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Brown, David B.; Vickers, Jerry W.; and Pell, Kynric M., 4,123,165, Cl. 356-152.000.
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Honjo, Yoshihiko, 4,123,780, Cl. 358-128.000.
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Vig, Satinder K., to American Sterilizer Company. Raise-lower device. 4,123,039, Cl. 254-9.00C.
Vigor, Charles W.: *See*—
Jandeska, William F.; Netherton, Charles F.; and Vigor, Charles W., 4,123,297, Cl. 148-103.000.
Vild, Joseph P.; Cleary, William I.; and Fox, Donald P., to Republic Steel Corporation. Method and apparatus for eddy current inspection of hot test pieces with means to cool the detector and to purge the test path of contaminants. 4,123,708, Cl. 324-224.000.
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Light, Kenneth K.; Sanders, James M.; Vock, Manfred H.; Shuster, Edward J.; Vinals, Joaquin; Schreiber, William L.; Hall, John B.; Hruza, Denis E., Sr.; Kamath, Venkatesh; Mookherjee, Braja D.; Tseng, Ching Y.; and Sprecker, Mark A., 4,123,393, Cl. 252-522.000.
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Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, 4,123,114, Cl. 302-53.000.
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Vock, Manfred H.: *See*—
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Armstrong, Warren E.; La France, Donald S.; and Voge, Hervey H., 4,122,671, Cl. 60-218.000.
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Perrington, Kenneth J.; Taylor, Phillip A.; and Vogelgesang, Peter J., 4,123,309, Cl. 156-234.000.
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Vogelsberg, William A., to General Motors Corporation. Ignition timing control. 4,122,808, Cl. 123-117.00A.
Vogt, B. Richard, to E. R. Squibb & Sons, Inc. Method for treatment of asthma. 4,123,532, Cl. 424-251.000.
Vogt, Harvey J.: *See*—
Campbell, Ramsey G.; Doane, Elliott P.; Heines, M. Henry; Naworski, Joseph S.; and Vogt, Harvey J., 4,123,467, Cl. 260-659.00A.
Volksen, Willi: *See*—
Rembaum, Alan; and Volksen, Willi, 4,123,396, Cl. 526-24.000.
Volkswagenwerk Aktiengesellschaft: *See*—
Barnert, Konrad; and Stein, Gunter, 4,122,813, Cl. 123-139.0ST.
Grundmann, Edgard, 4,122,756, Cl. 91-180.000.
Leunig, Ernst, 4,122,707, Cl. 73-118.00R.
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Schuster, Peter; and von Chiari, Bernd, 4,123,285, Cl. 106-40.00R.
Von Hoene, Donald C.; Chu, Joseph Y. C.; Chen, Inan; and Jones, Robert N., to Xerox Corporation. Electrostatographic photosensitive device comprising hole injecting and hole transport layers. 4,123,269, Cl. 96-1.0PC.
Von Strandtmann, Maximilian: *See*—
Connor, David T.; Young, Patricia A.; and Von Strandtmann, Maximilian, 4,123,536, Cl. 424-258.000.
Vose, Richard W.: *See*—
Clements, Luther D.; Hannan, Michael D.; Hinds, Robert J.; and Vose, Richard W., 4,123,357, Cl. 210-71.000.
Vossos, Peter H., to Nalco Chemical Company. Alkanol amine phosphate for improving electrostatic precipitation of dust particles. 4,123,234, Cl. 55-5.000.
Wagner Electric Corporation: *See*—
Pecota, Walter, 4,123,668, Cl. 307-10.0LS.
Wagner, Erich: *See*—
Mandler, Walter; Edwards, Garry; and Wagner, Erich, 4,123,144, Cl. 350-222.000.
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Wagner, George M., to Hooker Chemicals & Plastics Corp. Process for flame retarding cellulosics. 4,123,574, Cl. 427-341.000.
Walcon Corporation: *See*—
Bard, John A.; and Morrison, Francis J., 4,122,641, Cl. 52-403.000.
Walgenbach, David D.: *See*—
Kensler, Daniel L., Jr.; Kohn, Gustave K.; and Walgenbach, David D., 4,123,552, Cl. 424-311.000.
Walker, Darwyn E.: *See*—
McNamara, Michael M.; Mowe, Wayne T.; and Walker, Darwyn E., 4,123,492, Cl. 264-210.00F.
Walker, Frank J. Acoustical speaker device. 4,123,621, Cl. 179-1.00E.
Walker, Keith A. M., to Syntex (U.S.A.) Inc. Derivatives of N-alkyl imidazoles. 4,123,542, Cl. 424-273.00R.
Walker, William G.: *See*—
Morse, Lewis D.; Walker, William G.; and Hammes, Paul A., 4,123,382, Cl. 252-316.000.
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Zauner, John H.; and Waller, Lyle G., 4,123,597, Cl. 429-112.000.

Walter, Alfred, to Alfred Walter AG. Apparatus for testing a forms set for print through quality. 4,122,702, Cl. 73-14.000.

Walter, Lothar: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,123,121, Cl. 308-6.00C.

Walton, Edward: *See—*
Christensen, Burton G.; and Walton, Edward, 4,123,547, Cl. 424-274.000.

Walz, Theo; and Glauser, Fritz, to S I G Schweizerische Industrie-Gesellschaft. Apparatus for toppling conveyed articles. 4,122,938, Cl. 198-411.000.

Wambach, Allen D., to General Electric Company. Reinforced thermoplastic polyester compositions having improved resistance to heat deflection. 4,123,415, Cl. 260-40.00R.

Waninger, Rudolf; and Obrowski, Frank, to Wigo Gottlob Widmann & Soehne GmbH & Co. KG. Household coffee machine with calcification indicator. 4,122,763, Cl. 99-281.000.

Wanner, Karl, to Robert Bosch GmbH. Tool shank and chuck combination for a hammer drill. 4,123,074, Cl. 279-19.500.

Warn Industries, Inc.: *See—*
Kuzarov, Encho J., 4,123,040, Cl. 254-166.000.

Warner, Gregory L.; and Leng, Douglas E., to Dow Chemical Company, The. Continuous process for preparing aqueous polymer microsuspensions. 4,123,403, Cl. 260-29.2EP.

Warner-Lambert Company: *See—*
Behnke, Walter E.; Marsh, William R.; and Haskell, Theodore H., 4,123,609, Cl. 536-27.000.
Connor, David T.; Young, Patricia A.; and Von Strandtmann, Maximilian, 4,123,536, Cl. 424-258.000.

Warning, Klaus; and Mitzlaff, Michael, to Hoechst Aktiengesellschaft. Process for preparing trimeric Δ^1-piperideins and trimeric 1-pyrroline. 4,123,434, Cl. 260-296.00D.

Washburn, William F.: *See—*
Devine, William T.; and Washburn, William F., 4,123,669, Cl. 307-205.000.

Wasserman, David. Wheel supported luggage. 4,122,924, Cl. 190-18.00A.

Watanabe, Katsumi, to Yugen Kaisha Watanabe Kenkyusho. Phonograph for use with record cartridges. 4,123,065, Cl. 274-9.00B.

Watanabe, Shigeo: *See—*
Takigawa, Hiroyoshi; Watanabe, Shigeo; Aoki, Shigeta; and Ogawa, Hiroshi, 4,122,879, Cl. 152-209.00R.

Watanabe, Takeshi; and Kodama, Kenichiro, to Asahi-Dow Limited. Polyvinylidene chloride resin compositions. 4,123,477, Cl. 260-897.00C.

Waters, John R. Toy glider. 4,122,626, Cl. 46-11.000.

Watson, David: *See—*
Stringer, James A.; and Watson, David, 4,123,288, Cl. 106-100.000.

Weber, Bruce H.: *See—*
Gephart, Don A.; and Weber, Bruce H., 4,123,792, Cl. 361-30.000.

Weber, Harry W., Jr., to FMC Corporation. Process for preparing alkyl isocyanates. 4,123,450, Cl. 260-453.00P.

Weber, Robert; Katscher, Erich; and Schabert, Hans-Peter, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor plant. 4,123,323, Cl. 176-30.000.

Wehner, Raymond. Omniphonic microphone and loudspeaker system. 4,122,910, Cl. 181-144.000.

Weiland, Emil, to Messerschmitt-Bolkow-Blohm GmbH. Housing for a mechanical gear arrangement. 4,122,730, Cl. 74-606.00R.

Weisman, Eli. Coin sorting apparatus. 4,122,860, Cl. 133-3.00B.

Weiss, Karl; and Rost, Helmut, to Siemens Aktiengesellschaft. Patient securing device. 4,122,587, Cl. 128-134.000.

Weiss, Martin J.: *See—*
Bernaćy, Karel F.; Floyd, Middleton B., Jr.; Poletto, John F.; Schaub, Robert E.; and Weiss, Martin J., 4,123,456, Cl. 562-503.000.

Welchner, Ewald F.: *See—*
Krupey, John; and Welchner, Ewald F., 4,123,343, Cl. 204-180.00G.

Welding Industries of Australia Pty. Ltd.: *See—*
Brougham, William K., 4,123,736, Cl. 336-120.000.

Welker, Gerald H.: *See—*
Miers, Bruce W.; Proksch, Frederick D.; and Welker, Gerald H., 4,122,908, Cl. 180-68.00P.

Wells, William: *See—*
Pearce, Jai K.; and Wells, William, 4,123,042, Cl. 266-44.000.

Welsh, Jay Y.; and Sochol, Irving, to Chemetals Corporation. Recovering metal values from marine manganese nodules. 4,123,499, Cl. 423-35.000.

Wendorff, Jochen: *See—*
Klapdar, Wilhelm; Richter, Helmut; Rommerswinkel, Heinrich-Wilhelm; Spetzler, Edgar; and Wendorff, Jochen, 4,123,258, Cl. 75-58.000.

Wenzel, Wolfgang; and Dieterich, Dieter, to Bayer Aktiengesellschaft. Process for the manufacture of plastics containing ester and/or urethane groups. 4,123,423, Cl. 528-71.000.

Wernholm, Olle S. V.: *See—*
Rosander, Staffan B. F. S. J.; Sedlacek, Miroslav; and Wernholm, Olle S. V., 4,123,720, Cl. 328-234.000.

Wesch, Ludwig; Roma, Luis C.; and Pellicer, Carlos F. Fire-retarding epoxy resin material, method for the manufacture thereof and use thereof as coating composition. 4,123,575, Cl. 427-386.000.

Wesch, Ludwig; Roma, Luis C.; and Pellicer, Carlos F. Method of manufacturing a finely granular concentrate of fire-retarding foam-forming solid addition substances for plastics, varnishes, coating compositions, and similar substrates. 4,123,587, Cl. 428-407.000.

Weschenfelder, Otto T.; and Michalik, Horst B., to Koenig & Bauer Aktiengesellschaft. Gear folder. 4,123,048, Cl. 270-77.000.

West, Harold L.: *See—*
Smith, Bob R.; West, Harold L.; Bray, Thomas L.; and Wilder, Robert H., Sr., 4,122,877, Cl. 144-208.00E.

Westbrook, Dean Lee: *See—*
Tyner, Clifford Alan; and Westbrook, Dean Lee, 4,122,874, Cl. 140-147.000.

Western Electric Company, Inc.: *See—*
Sparzak, Walter J.; and Vesperman, William C., 4,123,585, Cl. 428-379.000.

Westin, Per-Olov; and Marklund, Per A., to AB Svenska Godscentraler; and AB Plastkarosser. Dangerous goods shipping container. 4,122,761, Cl. 98-33.00R.

Westinghouse Electric Corp.: *See—*
Anderson, Larry W.; and Franz, James H., Jr., 4,123,693, Cl. 318-376.000.
Bhalla, Ranbir S., 4,123,685, Cl. 313-218.000.
Bolin, Philip C., 4,123,619, Cl. 174-19.000.
Cooper, Glenn D.; and Litz, Donald C., 4,123,676, Cl. 310-52.000.
Cromer, Charles F.; Yoon, Kue H.; and Freeman, Willie B., 4,123,636, Cl. 200-148.00A.
Cushing, George B.; and Kothmann, Richard E., 4,123,618, Cl. 174-11.0BH.
Hopwood, Francis W.; and Staley, Lester K., 4,123,719, Cl. 328-155.000.
Maier, Alfred E.; and Hill, Robert H., 4,123,734, Cl. 335-9.000.
McCaskey, Harold O., Jr., 4,123,579, Cl. 428-264.000.
Rostron, Joseph R., 4,123,635, Cl. 200-148.00F.

Wexler, Howard; and Reiner, Lawrence L., to Mego Corp. Game with multiple choice strategy. 4,123,062, Cl. 273-248.000.

Weyerhaeuser Company: *See—*
Van Vliet, Raymond A., 4,122,582, Cl. 19-65.00R.

Wheldon, Robert J.: *See—*
Menown, Hugh; and Wheldon, Robert J., 4,123,684, Cl. 313-205.000.

Whirlpool Corporation: *See—*
Burke, Harry D., 4,123,643, Cl. 219-10.55R.

White, William R.; and Van Tighem, Gary P., to Occidental Petroleum Corporation. Flotation separation of glass from a mixture of comminuted inorganic materials using hydrocarbon sulfonates. 4,122,950, Cl. 209-12.000.

Whitlock, Leslie A. Underground fire hydrant frame and cover. 4,123,184, Cl. 404-25.000.

Whittaker Corporation: *See—*
Lasher, Edward A., 4,123,404, Cl. 260-29.40R.

Wibau: *See—*
Peleschka, Gerhard; and Nuebling, Friederich, 4,123,205, Cl. 418-127.000.

Wiblin, Wayne T.: *See—*
Palmer, Norman H. G.; and Wiblin, Wayne T., 4,123,740, Cl. 338-67.000.

Wicki, Heinz: *See—*
Holliger, Herbert; and Wicki, Heinz, 4,123,428, Cl. 260-145.00C.

Wiesner, Peter: *See—*
Heim, Ulrich; Leichnitz, Kurt; and Wiesner, Peter, 4,123,227, Cl. 23-232.00R.

Wigo Gottlob Widmann & Soehne GmbH & Co. KG: *See—*
Waninger, Rudolf; and Obrowski, Frank, 4,122,763, Cl. 99-281.000.

Wilczek, Stephen P., to Xerox Corporation. Copy reproduction machine with controller self check system. 4,122,996, Cl. 235-302.300.

Wilder, Robert H., Sr.: *See—*
Smith, Bob R.; West, Harold L.; Bray, Thomas L.; and Wilder, Robert H., Sr., 4,122,877, Cl. 144-208.00E.

Wiley, Paul F.: *See—*
Hanka, Ladislav J.; and Wiley, Paul F., 4,123,521, Cl. 424-121.000.

Wm. A. Nickerson & Co., Ltd.: *See—*
Keller, James R.; and Nickerson, William A., 4,123,315, Cl. 156-560.000.

William Beaumont Hospital: *See—*
Horwitz, Norman H., 4,123,660, Cl. 250-491.000.

Williams, Arthur C. Air-slot spacer clip. 4,122,762, Cl. 98-40.00D.

Williams, Joseph A.: *See—*
Bullock, Frederick C.; Engelhardt, Alvin; Cirincione, Thomas J.; and Williams, Joseph A., 4,123,173, Cl. 356-246.000.

Williams, Leon A., Jr.: *See—*
Thomas, David F., Jr.; and Williams, Leon A., Jr., 4,122,712, Cl. 73-189.000.

Williams, Robert E., to Exxon Production Research Company. Method of removing oil from water. 4,123,354, Cl. 210-40.000.

Williamson, Albert E., to Mobil Oil Corporation. Reducing SO_2 in refinery off gas. 4,123,505, Cl. 423-564.000.

Wilson, Mahlon T. Hydraulic control with feedback for powered machinery. 4,122,678, Cl. 60-571.000.

Wilson, Peter A.: *See—*
Rainer, Norman B.; and Wilson, Peter A., 4,123,592, Cl. 428-532.000.

Wilson, Phillip S.: *See—*
Holub, Fred F.; Scott, Steven W.; and Wilson, Phillip S., 4,123,436, Cl. 260-30.80R.
Mark, Victor; and Wilson, Phillip S., 4,123,413, Cl. 260-32.6NR.

Wine, Charles M., to RCA Corporation. Memory type tuning system with provisions to facilitate setup. 4,123,713, Cl. 325-455.000.

Winkelman, Wayne: *See—*
Dean, Lura C., Jr.; Boswell, Gary T.; Winkelman, Wayne; and Little, Frank S., 4,123,795, Cl. 364-200.000.

Winkworth, David A.: *See—*
Laws, William R.; and Winkworth, David A., 4,122,894, Cl. 165-76.000.

Winnebago Industries, Inc.: *See—*
Anderson, Michael O., 4,122,966, Cl. 220-1.500.

Winslow, John M., to Minnesota Mining and Manufacturing Company. Photothermographic toners. 4,123,282, Cl. 96-114.100.

Winston, Theodore. Solar energy collection panels and energy recovery systems. 4,123,003, Cl. 237-1.00A.

Wirz, Arno, to Heidelberger Druckmaschinen AG. Change-over means for a storage drum for sheet transferral. 4,122,773, Cl. 101-230.000.

Witco Chemical Corporation: *See—*
Cowell, Richard D.; Loewrigkeit, Peter; Rosenblatt, William; and Bluestein, Claire, 4,123,421, Cl. 528-65.000.

Witt, Frank A., to Colite Industries, Inc. Method and apparatus forming three dimensional sign display character. 4,122,616, Cl. 40-596.000.

Witten, John E.: *See—*
Wood, Loren E.; Witten, John E.; and Short, Edward H., III, 4,122,595, Cl. 29-424.000.

Woditsch, Peter: *See—*
Kohler, Klaus; Woditsch, Peter; and Schultz, Karl-Heinz, 4,123,501, Cl. 423-152.000.

Wohlberg, Donald B.: *See—*
Dodds, David E.; Sendyk, Andrzej M.; and Wohlberg, Donald B., 4,123,709, Cl. 325-38.00B.

Wohlers, Herbert C.: *See—*
Sifniades, Stylianos; Tunick, Allen A.; and Wohlers, Herbert C., 4,123,446, Cl. 260-439.00R.

Wolf, Edward D.; and Perkins, Walter E., Jr., to Hughes Aircraft Company. Contrast enhancement of electron beam alignment marks. 4,123,661, Cl. 250-492.00A.

Wolf-Gerate GmbH: *See—*
Joswig, Siegfried, 4,122,784, Cl. 111-3.000.

Wolfson, Leonard G. Hydrophilic contact lens case. 4,122,942, Cl. 206-5.100.

Wollschlager, Dieter: *See—*
Fischer, Stefan; Wollschlager, Dieter; Scharrenbroich, Helmut; and Fischer, Rainer, 4,123,217, Cl. 425-525.000.

Wood, Loren E.; Witten, John E.; and Short, Edward H., III, to Black, Sivalls & Bryson, Inc. Scored rupture disk manufacturing method. 4,122,595, Cl. 29-424.000.

Woodmansee, Wayne E.: *See—*
Geithman, Glenn A.; and Woodmansee, Wayne E., 4,122,724, Cl. 73-588.000.

Woodruff, Richard K., to Refractory Products Co. Heat-insulating fibrous panels. 4,122,644, Cl. 52-787.000.

Woolever, John T.: *See—*
Buchanan, Ronald L.; Woolever, John T.; and Jelenevsky, Alex M., 4,123,440, Cl. 260-326.280.

Wootten, Carl B. Method for prevention of fouling and corrosion utilizing technetium-99. 4,123,338, Cl. 204-147.000.

Worrix, Matthew L.: *See—*
Lott, Donald L.; Schockelt, Guenter G.; and Worrix, Matthew L., 4,123,637, Cl. 200-148.00A.

Wortley, George E., Jr.: *See—*
Vartiak, Joseph F.; and Wortley, George E., Jr., 4,123,249, Cl. 71-66.000.

Wulfing, Johann W.: *See—*
Credner, Karl; Brenner, Gunter; Tauscher, Manfred; and Jozic, Ljerka, 4,123,534, Cl. 424-253.000.

Wurfel, Helmut, to Saarbergwerke Aktiengesellschaft. Process for catalytic hydrogenation of coal. 4,123,348, Cl. 208-10.000.

Wurfel, Helmut, to Saarbergwerke Aktiengesellschaft. Separation of solids containing residues from liquid fractions of a coal hydrogenation process using an expansion engine and a pressure release means. 4,123,349, Cl. 208-10.000.

Wyatt, Kenneth L.; and Ilett, Keith J., to Air Products & Chemicals, Inc. Mechanical aerator. 4,123,482, Cl. 261-91.000.

Wylain, Inc.: *See—*
Ehret, Gordon F.; and Rowley, William N., 4,122,592, Cl. 29-404.000.

Wynne, Peter J., to Lectromelt Corporation. Electric arc furnace. 4,123,617, Cl. 13-10.000.

Wysocki, Edward J.: *See—*
Mac Intyre, Robert W.; Wysocki, Edward J.; Orifice, Philip; and DiTillio, Ralph, 4,123,630, Cl. 200-52.00R.

Xerox Corporation: *See—*
Fisher, Donald J., 4,123,154, Cl. 355-15.000.
Goffe, William L., 4,123,283, Cl. 96-1.0PS.
Von Hoene, Donald C.; Chu, Joseph Y. C.; Chen, Inan; and Jones, Robert N., 4,123,269, Cl. 96-1.0PC.
Wilczek, Stephen P., 4,122,996, Cl. 235-302.300.

Xomed Inc.: *See—*
Haerr, Raymond H., 4,122,857, Cl. 128-348.000.

Yachin, Ami; and Gozhansky, Baruch, to Laser Industries Ltd. Laser beam aligning apparatus. 4,123,143, Cl. 350-171.000.

Yaesu Rehabili Co., Ltd.: *See—*
Tsuchiya, Kazuo; and Ohnishi, Noboru, 4,122,840, Cl. 128-2.00S.

Yamabe, Masaaki: *See—*
Ukihashi, Hiroshi; Yamabe, Masaaki; and Miyake, Haruhisa, 4,123,602, Cl. 526-206.000.

Yamada, Tetsuo: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.

Yamada, Yoshiro: *See—*
Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, 4,123,296, Cl. 148-36.000.

Yamaguchi, Jousuke: *See—*
Hanyo, Susumu; Yamaguchi, Jousuke; Morishita, Yoshiyuki; and Noguchi, Itoshi, 4,122,697, Cl. 72-128.000.

Yamakoshi, Noboru; Kaneda, Tsugio; Hatsuoka, Nobuyasu; Shimazu, Shinichi; Fujita, Tatsu; Yamada, Yoshiro; Yamada, Tetsuo; and Mizuta, Atsuo, to Kobe Steel, Ltd. High strength steel rod of large gauge. 4,123,296, Cl. 148-36.000.

Yamakoshi, Yasumichi: *See—*
Seko, Maomi; Yamakoshi, Yasumichi; Miyauchi, Hirotsugu; Kimoto, Kyoji; and Masuda, Yoshinori, 4,123,336, Cl. 204-98.000.

Yamamoto, Masao; and Iwanaga, Sumio, to Shionogi & Co., Ltd. Apparatus for detecting flaws in circular tablet. 4,123,352, Cl. 209-546.000.

Yamamoto, Yoshihiko: *See—*
Yamamura, Takashi; Tabata, Norikazu; and Yamamoto, Yoshihiko, 4,123,664, Cl. 250-536.000.

Yamamoto, Yukio, to Yoshida Kogyo K.K. Water-drainable gasket. 4,123,071, Cl. 277-205.000.

Yamamura, Takashi; Tabata, Norikazu; and Yamamoto, Yoshihiko, to Mitsubishi Denki Kabushiki Kaisha. Ozone generating apparatus. 4,123,664, Cl. 250-536.000.

Yamanari, Shozo: *See—*
Sugisaki, Toshihiko; Horiuchi, Tetsuo; Ogasawara, Hideo; Yamanari, Shozo; and Tominaga, Kenji, 4,123,327, Cl. 176-76.000.

Yamane, Hiroyuki: *See—*
Kawamura, Masatada; and Yamane, Hiroyuki, 4,122,797, Cl. 116-137.00A.

Yamashita, Koji: *See—*
Nagata, Koichi; Oda, Takashi; and Yamashita, Koji, 4,123,756, Cl. 343-702.000.

Yamashita, Toshinori, to Nippon Gakki Seizo Kabushiki Kaisha. Lug assembly for anchoring drum heads to drum body. 4,122,747, Cl. 84-411.00R.

Yamato Scale Company, Ltd.: *See—*
Umeda, Shoji; and Yoshikawa, Akio, 4,122,770, Cl. 101-93.190.

Yang, Chao-Yie: *See—*
Radkowsky, Alvin; Chien, Ji-Peng; Yang, Chao-Yie; and Hsieh, Horng-Ming, 4,123,328, Cl. 176-78.000.

Yates, Chester R., to Steadley Company, Inc. Foundation unit having a posturized inner border. 4,122,566, Cl. 5-260.000.

Yazima, Shinkichi: *See—*
Komatsu, Fumito; and Yazima, Shinkichi, 4,123,015, Cl. 242-191.000.

Yeater, Robert P.: *See—*
Heiss, Herbert L.; Yeater, Robert P.; and Carter, Russell P., Jr., 4,123,419, Cl. 260-45.8NZ.

Yeh, Rudolph: *See—*
Holloway, Gale A.; Yeh, Rudolph; and Zagotta, Joseph L., 4,122,868, Cl. 137-625.690.

Yiu, Joseph T.; and Holmes, Roy L., to Hy-Gain De Puerto Rico, Inc. Scanning receiver having priority channel indication in memory. 4,123,717, Cl. 325-470.000.

Yokokawa, Yasuo: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.

Yokokura, Chiyokatsu: *See—*
Oda, Takaaki; and Yokokura, Chiyokatsu, 4,123,085, Cl. 280-752.000.

Yokoo, Nobuhiro: *See—*
Kanbara, Tohru; Uemura, Michihiko; and Yokoo, Nobuhiro, 4,123,731, Cl. 333-30.00R.

Yokota, Hideo: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; Asaeda, Tsuyoshi; Fukushima, Tadahide; Shingu, Tamotsu; Hashimoto, Shigeru; and Iwashita, Tomonori, 4,123,650, Cl. 250-201.000.

Yokoyama, Tohei; and Urayama, Kiyoshi, to Kabushiki Kaisha Hosokawa Funtai Kogaku Kenkyusho. Apparatus for measuring flow rate of powdery and/or granular material. 4,122,715, Cl. 73-228.000.

Yonezawa, Toshio: *See—*
Ajima, Takashi; Takaoki, Kiyoshi; and Yonezawa, Toshio, 4,123,564, Cl. 427-85.000.

Yoon, Kue H.: *See—*
Cromer, Charles F.; Yoon, Kue H.; and Freeman, Willie B., 4,123,636, Cl. 200-148.00A.

Yoshida Kogyo K.K.: *See—*
Yamamoto, Yukio, 4,123,071, Cl. 277-205.000.

Yoshida, Narumi: *See—*
Morishita, Masataka; Fukushima, Mitsuru; Sasagawa, Tutomu; Inaba, Yoshihito; Yokokawa, Yasuo; Araragi, Satoshi; Yoshida, Narumi; and Uchiyama, Hachiro, 4,123,381, Cl. 252-316.000.

Yoshida, Ryo; Takemoto, Ichiki; Sumida, Seizo; and Kamoshita, Katsuzo, to Sumitomo Chemical Company, Limited. N-(4-substituted benzyloxy)phenyl)-N-methyl-N-methoxyurea. 4,123,256, Cl. 71-105.000.

Yoshida, Takashi: *See—*
Karino, Yukio; Sakaguchi, Shinji; and Yoshida, Takashi, 4,123,275, Cl. 96-77.000.

Yoshida, Yukihiro: *See*—
Tanimoto, Akira; Katoh, Sanao; and Yoshida, Yukihiro, 4,122,786, Cl. 112-158.00E.

Yoshikawa, Akio: *See*—
Umeda, Shoji; and Yoshikawa, Akio, 4,122,770, Cl. 101-93.190.

Yoshikawa, Masazi; and Sawada, Tomoe, to Murata Manufacturing Co., Ltd. Spark plug cap. 4,123,688, Cl. 315-58.000.

Yoshimura, Kazunori: *See*—
Ito, Katsuo; and Yoshimura, Kazunori, 4,123,781, Cl. 358-191.000.

Yoshimura, Shigeru: *See*—
Kitahara, Sigeyosi; Okada, Isamu; Jumonji, Shigeru; Nemoto, Takayuki; Yoshimura, Shigeru; Soma, Tsunenori; and Shinoda, Nobuhiko, 4,123,782, Cl. 358-210.000.

Young, Patricia A.: *See*—
Connor, David T.; Young, Patricia A.; and Von Strandtmann, Maximilian, 4,123,536, Cl. 424-258.000.

Yugen Kaisha Watanabe Kenkyusho: *See*—
Watanabe, Katsumi, 4,123,065, Cl. 274-9.00B.

Yukawa, Osamu: *See*—
Okikawa, Susumu; Yukawa, Osamu; Mikino, Hiroshi; and Nonaka, Yoshio, 4,123,293, Cl. 148-11.50C.

Yukishita, Tuyoshi, to Shiina, Osamu; and Yukishita, Tuyoshi. Spray pipe for use in a pipe line. 4,123,006, Cl. 239-266.000.

Yusa, Hideo: *See*—
Sugimoto, Yoshikazu; Yusa, Hideo; Kato, Yomei; Kamiya, Kunio; and Kikuchi, Makoto, 4,123,356, Cl. 210-67.000.

Zacher, Albert R., Jr.: *See*—
Krippner, Kenneth E.; and Zacher, Albert R., Jr., 4,123,657, Cl. 250-385.000.

Zagotta, Joseph L., to International Harvester Company. Hydraulic valve with open center metering notches. 4,122,867, Cl. 137-625.300.

Zagotta, Joseph L.: *See*—
Holloway, Gale A.; Yeh, Rudolph; and Zagotta, Joseph L., 4,122,868, Cl. 137-625.690.

Zaitsev, Mikhail P.: *See*—
Mash, Dmitry M.; Schedrovitsky, Savely S.; Golovko, Zoya I.; Zaitsev, Mikhail P.; Sorokin, Andrei N.; Belyaeva, Agnia A.; and Kharitonov, Ivan I., 4,123,735, Cl. 336-30.000.

Zanetta, Hugues: *See*—
Michelet, Jacques; and Zanetta, Hugues, 4,123,045, Cl. 266-275.000.

Zauner, John H.; and Waller, Lyle G., to National Union Electric Corporation. Thermal cells. 4,123,597, Cl. 429-112.000.

Zdrojkowski, Ronald J., to Electro-Technics, Inc. Electrode system for a heart rate monitor. 4,122,843, Cl. 128-2.06E.

Zeiss, Carl: *See*—
Aurin, Friedrich, 4,123,151, Cl. 350-301.000.

Zellweger, Ltd.: *See*—
Felix, Ernst, 4,122,657, Cl. 57-81.000.

Zemedelsky nakupni a zasobovaci podnik narodni podnik: *See*—
Rataj, Stanislav; Krch, Karel; Pilousek, Josef; Blazek, Jaroslav; Vitek, Hynek; and Macek, Ladislav, 4,123,114, Cl. 302-53.000.

Zengel, Hans-Georg; and Bergfeld, Manfred, to Akzona Incorporated. Benzene-tricarboxylic acid-(1,3,5)-tri-N-chloramide and process for the preparation thereof. 4,123,461, Cl. 260-558.00A.

Zinsstag, Christoph: *See*—
Jackson, Barry; and Zinsstag, Christoph, 4,123,460, Cl. 260-544.00D.

Zipay, Albert J.; and Gorzegno, Walter P., to Foster Wheeler Energy Corporation. Low pressure drop girth baffle steam separator. 4,123,237, Cl. 55-205.000.

Zlafop pri BAN: *See*—
Malinovski, Yordan P.; Mednikarov, Borislav D.; and Assa, Jakob J., 4,123,280, Cl. 96-94.0BF.

Zubricki, Theodore. Water sampling bucket. 4,122,721, Cl. 73-354.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 31ST DAY OF OCTOBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aron, Erwin, to Technical Processing, Inc. Novel processing aids for natural and synthetic rubber compounds. Re. 29,821, Cl. 260-23.70M.

Bone, Arnold R., to Dennison Manufacturing Company. Fastener attachment system needle constructions. Re. 29,819, Cl. 227-67.000.

Dennison Manufacturing Company: *See*—
Bone, Arnold R., Re. 29,819, Cl. 227-67.000.

Donohue, James M.: *See*—
Gerbasi, Dennis P.; and Donohue, James M., Re. 29,818, Cl. 118-652.000.

Gerbasi, Dennis P.; and Donohue, James M., to Xerox Corporation. Toner-reclaiming system. Re. 29,818, Cl. 118-652.000.

IEC-Holden Ltd.: *See*—
Winsor, Robert B.; and Thomson, George, Re. 29,816, Cl. 16-143.000.

Konicek, Jiri K., to Perstorp, AB. Method for the production of material for printed circuits. Re. 29,820, Cl. 156-630.000.

Lieb, Nathaniel H.; and Wallace, Richard A., to Star Dental Manufacturing Co. Inc. Dental pin. Re. 29,817, Cl. 32-15.000.

Perstorp, AB: *See*—
Konicek, Jiri K., Re. 29,820, Cl. 156-630.000.

Star Dental Manufacturing Co. Inc.: *See*—
Lieb, Nathaniel H.; and Wallace, Richard A., Re. 29,817, Cl. 32-15.000.

Technical Processing, Inc.: *See*—
Aron, Erwin, Re. 29,821, Cl. 260-23.70M.

Thomson, George: *See*—
Winsor, Robert B.; and Thomson, George, Re. 29,816, Cl. 16-143.000.

Wallace, Richard A.: *See*—
Lieb, Nathaniel H.; and Wallace, Richard A., Re. 29,817, Cl. 32-15.000.

Winsor, Robert B.; and Thomson, George, to IEC-Holden Ltd. Lockable hinge structure. Re. 29,816, Cl. 16-143.000.

Xerox Corporation: *See*—
Gerbasi, Dennis P.; and Donohue, James M., Re. 29,818, Cl. 118-652.000.

LIST OF PLANT PATENTEES

Kitahara, Toru. Grapevine. 4,329, 10-31-78, Cl. 47.000.

Pan-American Plant Company: *See*—
Shoesmith, Leonard H., 4,326, Cl. 74.000.
Shoesmith, Leonard H., 4,328, Cl. 74.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum plant named Parliament. 4,326, 10-31-78, Cl. 74.000.

Shoesmith, Leonard H., to Pan-American Plant Company. Chrysanthemum named Buckeye. 4,328, 10-31-78, Cl. 74.000.

University of Minnesota, Regents of The: *See*—
Widmer, Richard E., 4,327, Cl. 75.000.

Widmer, Richard E., to University of Minnesota, Regents of The. Chrysanthemum named Minngopher. 4,327, 10-31-78, Cl. 75.000.

LIST OF DESIGN PATENTEES

Adkisson, Doris J.: *See*—
Bartolac, Catherine; and Adkisson, Doris J., 250,138, Cl. D30-37.000.

American Cyanamid Company: *See*—
Strang, Allen H.; and Polito, Emil, 250,090, Cl. D9-168.000.

Antinucci, Dominic, Jr. Candle. 250,145, 10-31-78, Cl. D73-1.00R.

Aust, Louis E. Soap holder. 250,076, 10-31-78, Cl. D6-90.000.

Axelsson, Per Axel Torbjorn. Interdental stimulator block. 250,132, 10-31-78, Cl. D28-64.000.

Azbill, Helen C.: *See*—
Porter, Laurence G., deceased; Smith, Mildred E., administratrix; and Azbill, Helen C., 250,133, Cl. D34-5.0SS.

Barteis, Klaus R.; and Bartels, Ruth W. Christmas garland. 250,101, 10-31-78, Cl. D11-119.000.

Barteis, Ruth W.: *See*—
Barteis, Klaus R.; and Barteis, Ruth W., 250,101, Cl. D11-119.000.

Bartolac, Catherine; and Adkisson, Doris J. Blanket for a foal or the like. 250,138, 10-31-78, Cl. D30-37.000.

Baumgartner, Alfred, to Zimm-Zamm Aktiengesellschaft. Bat or racket. 250,134, 10-31-78, Cl. D34-5.0ST.

Bell Telephone Laboratories, Incorporated: *See*—
Genaro, Donald M.; Meyerle, John A.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,108, Cl. D14-60.000.
Genaro, Donald M.; Meyerle, John M.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,109, Cl. 14-60.000.

Berwald, Ernst, to Schering Aktiengesellschaft. Transport container for dangerous liquids. 250,123, 10-31-78, Cl. D23-2.000.

Bourgeois, Ronald D. Roller conveyor belt. 250,103, 10-31-78, Cl. D12-60.000.

Bourgeois, Ronald D. Roller conveyor belt with flights. 250,104, 10-31-78, Cl. D12-60.000.

Breger, Carl A., to Shapes Establishment. Knife handle. 250,082, 10-31-78, Cl. D7-152.000.

Bridgestone Tire Company Limited: *See*—
Iwata, Norio; and Kojima, Hiroshi, 250,107, Cl. D12-146.000.

Brinkley, Joseph B. Ball gauge. 250,096, 10-31-78, Cl. D10-64.000.

Brown, Stanley R. Self-cleaning diaphragm for racing plate. 250,139, 10-31-78, Cl. D30-35.000.

Bunker Ramo Corporation: *See*—
Coppola, John B., 250,144, Cl. D64-11.00R.

Burd, Inc., Howell Division: *See*—
Petersen, Warren D., 250,073, Cl. D6-66.000.
Petersen, Warren D., 250,074, Cl. D6-56.000.
Petersen, Warren D., 250,075, Cl. D6-67.000.

Caccioli, Anthony; Carlson, Philip A.; and Guidi, David, to Gulf & Western Manufacturing Company. Press frame. 250,118, 10-31-78, Cl. D15-123.000.

Candiliotis, Gerassimos C., to Uniroyal, Inc. Pneumatic tire tread and buttreess. 250,106, 10-31-78, Cl. D12-143.000.

Cantrell, Thomas L.: *See*—
Glaspie, Donald L.; and Cantrell, Thomas L., 250,124, Cl. D23-4.000.

Carlson, Philip A.: *See*—
Caccioli, Anthony; Carlson, Philip A.; and Guidi, David, 250,118, Cl. D15-123.000.

Celluloid S.A.: *See*—
Wachtel, Jean L., 250,069, Cl. D4-35.000.

Champion International Corporation: *See*—
Cottrell, Edward D., 250,070, Cl. D6-25.000.
Schillinger, Joseph F., 250,093, Cl. D9-245.000.

Chaparral Industries, Inc.: *See*—
Moyski, John G.; and Mueller, Horst W., 250,135, Cl. D34-5.00K.

Chemetron Corporation: *See*—
Lewis, George T.; and Price, John H., 250,131, Cl. D28-8.000.

Chicago Pneumatic Tool Company: *See*—
Kirschensteiner, Raymond J.; Foran, Kenneth C.; Greenlee, Hugh T.; Hess, Roy P.; and Schaedler, Raymond J., 250,084, Cl. D8-68.000.

Christer Odvik AB: *See*—
Forsman, Tore A.; and Odvik, Christer, 250,094, Cl. D10-64.000.

Cone, Richard E. Support for potted plants. 250,102, 10-31-78, Cl. D11-164.000.

Coppola, John B., to Bunker Ramo Corporation. Validation/journal printer. 250,144, 10-31-78, Cl. D64-11.00R.

Cottrell, Edward D., to Champion International Corporation. Com-

bined stick inserter and display stand for a food product. 250,070, 10-31-78, Cl. D6-25.000.
Cress, William C., Jr.: *See—*
Douglas, Neil W.; and Cress, William C., Jr., 250,095, Cl. D10-64.000.
D. & C. Manufacturing Co., Inc.: *See—*
Douglas, Neil W.; and Cress, William C., Jr., 250,095, Cl. D10-64.000.
Dickerson, Arque B., to UOP Inc. Multi-passenger aircraft seat. 250,071, 10-31-78, Cl. D6-48.000.
Dinger, Pauline M. Applique. 250,140, 10-31-78, Cl. D33-9.00C.
Dorfman, Steven R., to L.J.N. Toys, Ltd. Toy microphone. 250,137, 10-31-78, Cl. D34-15.00C.
Douglas, Neil W.; and Cress, William C., Jr., to D. & C. Manufacturing Co., Inc. Electrical box setting gauge. 250,095, 10-31-78, Cl. D10-64.000.
Douglas, William K., to Warner-Lambert Company. Razor. 250,130, 10-31-78, Cl. D28-46.000.
Dresser Industries, Inc.: *See—*
Todd, John A., 250,143, Cl. D52-2.00A.
Ducotey, Robert F. Nipple and bottle cleaning brush. 250,068, 10-31-78, Cl. D4-08.000.
Dunn, Kathy A.: *See—*
Schoenfield, Palmer J.; Dunn, Kathy A.; and Morrison, Howard J., 250,092, Cl. D9-192.000.
Engmans. Inc.: *See—*
TenEyck, Richard E.; Robbins, Richard J.; Fee, Robert W.; Meister, Michael L.; and Kraft, John R., 250,141, Cl. D48-24.00A.
Fee, Robert W.: *See—*
TenEyck, Richard E.; Robbins, Richard J.; Fee, Robert W.; Meister, Michael L.; and Kraft, John R., 250,141, Cl. D48-24.00A.
Finker, Leon; and Finker, Marvin. Precious, semiprecious or synthetic cut stone. 250,100, 10-31-78, Cl. D11-90.000.
Finker, Marvin: *See—*
Finker, Leon; and Finker, Marvin, 250,100, Cl. D11-90.000.
Fong, David G. Chair or similar article. 250,072, 10-31-78, Cl. D6-56.000.
Foran, Kenneth C.: *See—*
Kirschensteiner, Raymond J.; Foran, Kenneth C.; Greenlee, Hugh T.; Hess, Roy P.; and Schaedler, Raymond J., 250,084, Cl. D8-68.000.
Forsman, Tore A.; and Odvik, Christer, to Toringe Consult AB; and Christer Odvik AB. Measuring instrument for dental files. 250,094, 10-31-78, Cl. D10-64.000.
Fuji Photo Film Co., Ltd.: *See—*
Munakata, Tsuneaki; and Fukuda, Hiroshi, 250,120, Cl. D16-06.000.
Fukuda, Hiroshi: *See—*
Munakata, Tsuneaki; and Fukuda, Hiroshi, 250,120, Cl. D16-06.000.
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Glitsch, Inc.: *See—*
Glaspie, Donald L.; and Cantrell, Thomas L., 250,124, Cl. D23-4.000.
Granberg, Elof. Chain saw sharpening device. 250,086, 10-31-78, Cl. D8-91.000.
Greenlee, Hugh T.: *See—*
Kirschensteiner, Raymond J.; Foran, Kenneth C.; Greenlee, Hugh T.; Hess, Roy P.; and Schaedler, Raymond J., 250,084, Cl. D8-68.000.
Guidi, David: *See—*
Caccioli, Anthony; Carlson, Philip A.; and Guidi, David, 250,118, Cl. D15-123.000.
Gulf & Western Manufacturing Company: *See—*
Caccioli, Anthony; Carlson, Philip A.; and Guidi, David, 250,118, Cl. D15-123.000.
Handelsbolaget Scanovator: *See—*
Hasselqvist, Stig, 250,142, Cl. D48-38.000.
Hasselqvist, Stig, to Handelsbolaget Scanovator. Lamp post. 250,142, 10-31-78, Cl. D48-38.000.
Hendershot, Robert V. Position indicator. 250,097, 10-31-78, Cl. D10-65.000.
Hess, Roy P.: *See—*
Kirschensteiner, Raymond J.; Foran, Kenneth C.; Greenlee, Hugh T.; Hess, Roy P.; and Schaedler, Raymond J., 250,084, Cl. D8-68.000.
Hickman, Ronald P.; and Luff, Brian Anthony. Workbench. 250,079, 10-31-78, Cl. D6-178.000.
Ibel, Manfred. Combination water closet and bidet. 250,126, 10-31-78, Cl. D23-51.000.
Insalaco, Charles J. Shovel blade. 250,083, 10-31-78, Cl. D8-10.000.
Iwata, Norio; and Kojima, Hiroshi, to Bridgestone Tire Company Limited. Vehicle tire. 250,107, 10-31-78, Cl. D12-146.000.
Jewell, Donald K., to Restaurant Technology, Inc. Beverage container carrier. 250,091, 10-31-78, Cl. D9-179.000.
Kabushiki Kaisha Brethren Shoji: *See—*
Miyazawa, Tadashi, 250,128, Cl. D24-21.000.
Kavalaris, Harold C., to Keystone Aniline & Chemical Co. Barbecue tool. 250,080, 10-31-78, Cl. D7-105.000.
Kawamura, Gentaro. Portable electrical vacuum cleaner. 250,115, 10-31-78, Cl. D15-52.000.
Keystone Aniline & Chemical Co.: *See—*
Kavalaris, Harold C., 250,080, Cl. D7-105.000.
Kieft, Arthur C.: *See—*
Stansberry, Warren H., Jr.; and Kieft, Arthur C., 250,081, Cl. D7-136.000.
Kirschensteiner, Raymond J.; Foran, Kenneth C.; Greenlee, Hugh T.; Hess, Roy P.; and Schaedler, Raymond J., to Chicago Pneumatic Tool Company. Pneumatic drill. 250,084, 10-31-78, Cl. D8-68.000.
Kojima, Hiroshi: *See—*
Iwata, Norio; and Kojima, Hiroshi, 250,107, Cl. D12-146.000.
Kraft, John R.: *See—*
TenEyck, Richard E.; Robbins, Richard J.; Fee, Robert W.; Meister, Michael L.; and Kraft, John R., 250,141, Cl. D48-24.00A.
L.J.N. Toys, Ltd.: *See—*
Dorfman, Steven R., 250,137, Cl. D34-15.00C.
Lalonde, Michael G. Ice cube tray. 250,117, 10-31-78, Cl. D15-90.000.
Land, Elvert H., Jr. Helmet face shield mounting bracket. 250,067, 10-31-78, Cl. D2-232.000.
LaPolice, George D. Sewing machine. 250,116, 10-31-78, Cl. D15-69.000.
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Luff, Brian Anthony: *See—*
Hickman, Ronald P.; and Luff, Brian Anthony, 250,079, Cl. D6-178.000.
M & M Luggage Co., Inc.: *See—*
Stark, Theodore, 250,087, Cl. D8-346.000.
Marvin Glass & Associates: *See—*
Schoenfield, Palmer J.; Dunn, Kathy A.; and Morrison, Howard J., 250,092, Cl. D9-192.000.
Massey-Ferguson Inc.: *See—*
Segales, Jaime, 250,114, Cl. D15-30.000.
McDonald, James R., Jr. Combined pipe hanger and seismic brace. 250,088, 10-31-78, Cl. D8-355.000.
Meister, Michael L.: *See—*
TenEyck, Richard E.; Robbins, Richard J.; Fee, Robert W.; Meister, Michael L.; and Kraft, John R., 250,141, Cl. D48-24.00A.
Meyerie, John M.: *See—*
Genaro, Donald M.; Meyerie, John M.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,109, Cl. 14-60.000.
Meyerle, John A.: *See—*
Genaro, Donald M.; Meyerle, John A.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,108, Cl. D14-60.000.
Michelau, Fredrick, to Radio Steel & Mfg. Co. Tricycle. 250,105, 10-31-78, Cl. D12-112.000.
Miyazawa, Tadashi, to Kabushiki Kaisha Brethren Shoji. Sphygmomanometer. 250,128, 10-31-78, Cl. D24-21.000.
Morrison, Howard J.: *See—*
Schoenfield, Palmer J.; Dunn, Kathy A.; and Morrison, Howard J., 250,092, Cl. D9-192.000.
Moyski, John G.; and Mueller, Horst W., to Chaparral Industries, Inc. Exerciser. 250,135, 10-31-78, Cl. D34-5.00K.
Mueller, Horst W.: *See—*
Moyski, John G.; and Mueller, Horst W., 250,135, Cl. D34-5.00K.
Munakata, Tsuneaki; and Fukuda, Hiroshi, to Fuji Photo Film Co., Ltd. Camera. 250,120, 10-31-78, Cl. D16-06.000.
Nobata, Tetsuo. Compressor. 250,113, 10-31-78, Cl. D15-9.000.
Odvik, Christer: *See—*
Forsman, Tore A.; and Odvik, Christer, 250,094, Cl. D10-64.000.
Pallante, Rocco. Insulating wire fastening member for use on shingles or siding. 250,110, 10-31-78, Cl. D13-17.000.
Peral Hernandez, Antonio; and Porras, Soledad Salcedo, widow and heir. Telephone apparatus. 250,111, 10-31-78, Cl. D14-53.000.
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Petersen, Warren D., to Burd, Inc., Howell Division. Chair or similar article. 250,074, 10-31-78, Cl. D6-56.000.
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Polito, Emil: *See—*
Strang, Allen H.; and Polito, Emil, 250,090, Cl. D9-168.000.
Porras, Soledad Salcedo, widow and heir: *See—*
Peral Hernandez, Antonio; and Porras, Soledad Salcedo, widow and heir, 250,111, Cl. D14-53.000.
Porter, Laurence G., deceased; by Smith, Mildred E., administratrix; and Azbill, Helen C. Game board. 250,133, 10-31-78, Cl. D34-5.0SS.
Price, John H.: *See—*
Lewis, George T.; and Price, John H., 250,131, Cl. D28-8.000.
Qualls, Stephen R. Irrigation shaft guard. 250,119, 10-31-78, Cl. D15-138.000.
Radio Steel & Mfg. Co.: *See—*
Michelau, Fredrick, 250,105, Cl. D12-112.000.
Ramacher, Robert G., Jr. Wood stove. 250,127, 10-31-78, Cl. D23-97.000.
Restaurant Technology, Inc.: *See—*
Jewell, Donald K., 250,091, Cl. D9-179.000.

Robbins, Richard J.: *See*—
TenEyck, Richard E.; Robbins, Richard J.; Fee, Robert W.; Meister, Michael L.; and Kraft, John R., 250,141, Cl. D48-24.00A.
Rollei-Werke Franke & Heidecke: *See*—
Waaske, Heinz, 250,121, Cl. D16-06.000.
Sandoz, Inc.: *See*—
Skinner, Norman, 250,129, Cl. D24-56.000.
Tuttle, Glenn L., 250,085, Cl. D8-72.000.
Schaedler, Raymond J.: *See*—
Kirschensteiner, Raymond J.; Foran, Kenneth C.; Greenlee, Hugh T.; Hess, Roy P.; and Schaedler, Raymond J., 250,084, Cl. D8-68.000.
Schering Aktiengesellschaft: *See*—
Berwald, Ernst, 250,123, Cl. D23-2.000.
Schillinger, Joseph F., to Champion International Corporation. Blank for drinking glass carrier. 250,093, 10-31-78, Cl. D9-245.000.
Schoenfield, Palmer J.; Dunn, Kathy A.; and Morrison, Howard J., to Marvin Glass & Associates. Packaging container. 250,092, 10-31-78, Cl. D9-192.000.
Segales, Jaime, to Massey-Ferguson Inc. Vehicle cab. 250,114, 10-31-78, Cl. D15-30.000.
Shapes Establishment: *See*—
Breger, Carl A., 250,082, Cl. D7-152.000.
Silliman, Thomas B. Omnidirectional circularly polarized transmitting antenna. 250,112, 10-31-78, Cl. D14-86.000.
Skinner, Norman, to Sandoz, Inc. Specimen collection unit. 250,129, 10-31-78, Cl. D24-56.000.
Smith, Mildred E., administratrix: *See*—
Porter, Laurence G., deceased; Smith, Mildred E., administratrix; and Azbill, Helen C., 250,133, Cl. D34-5.0SS.
Stanco Metal Products, Inc.: *See*—
Stansberry, Warren H., Jr.; and Kieft, Arthur C., 250,081, Cl. D7-136.000.
Stansberry, Warren H., Jr.; and Kieft, Arthur C., to Stanco Metal Products, Inc. Stove burner liner. 250,081, 10-31-78, Cl. D7-136.000.
Stark, Theodore, to M & M Luggage Co., Inc. Combined luggage flap, tab and concealed catch or similar article. 250,087, 10-31-78, Cl. D8-346.000.
Stokes, Rembert R.: *See*—
Genaro, Donald M.; Meyerle, John A.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,108, Cl. D14-60.000.
Genaro, Donald M.; Meyerie, John M.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,109, Cl. 14-60.000.
Strang, Allen H.; and Polito, Emil, to American Cyanamid Company. Combined bottle and cap or similar article. 250,090, 10-31-78, Cl. D9-168.000.
Swedish Fashion Group, Ltd., The: *See*—
Truedsson, Gilbert, 250,066, Cl. D2-208.000.
Sylvester, Gordon E.: *See*—
Genaro, Donald M.; Meyerle, John A.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,108, Cl. D14-60.000.
Genaro, Donald M.; Meyerie, John M.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,109, Cl. 14-60.000.
Telefonaktiebolaget L M Ericsson: *See*—
Legerius, Bengt E., 250,089, Cl. D8-396.000.
TenEyck, Richard E.; Robbins, Richard J.; Fee, Robert W.; Meister, Michael L.; and Kraft, John R., to Engmans. Inc. Utility light. 250,141, 10-31-78, Cl. D48-24.00A.
Tilley, Alvin R.: *See*—
Genaro, Donald M.; Meyerle, John A.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,108, Cl. D14-60.000.
Genaro, Donald M.; Meyerie, John M.; Stokes, Rembert R.; Sylvester, Gordon E.; and Tilley, Alvin R., 250,109, Cl. 14-60.000.
Todd, John A., to Dresser Industries, Inc. Gasoline dispenser. 250,143, 10-31-78, Cl. D52-2.00A.
Toringe Consult AB: *See*—
Forsman, Tore A.; and Odvik, Christer, 250,094, Cl. D10-64.000.
Truedsson, Gilbert, to Swedish Fashion Group, Ltd., The. Shirt. 250,066, 10-31-78, Cl. D2-208.000.
Tuttle, Glenn L., to Sandoz, Inc. Blood flow controller and the like. 250,085, 10-31-78, Cl. D8-72.000.
Uniroyal, Inc.: *See*—
Candiliotis, Gerassimos C., 250,106, Cl. D12-143.000.
UOP Inc.: *See*—
Dickerson, Arque B., 250,071, Cl. D6-48.000.
Urbach, Walter, Jr. Shoe rack for locker doors or the like. 250,077, 10-31-78, Cl. D6-116.000.
van Mastrigt, Max, to W. C. Dillon and Company, Inc. Scale calibrating machine. 250,098, 10-31-78, Cl. D10-83.000.
W. C. Dillon and Company, Inc.: *See*—
van Mastrigt, Max, 250,098, Cl. D10-83.000.
Waaske, Heinz, to Rollei-Werke Franke & Heidecke. Miniature camera. 250,121, 10-31-78, Cl. D16-06.000.
Wachtel, Jean L., to Celluloid S.A. Brush. 250,069, 10-31-78, Cl. D4-35.000.
Warner-Lambert Company: *See*—
Douglas, William K., 250,130, Cl. D28-46.000.
Wilcock, Anthony C. Saddle clamp for a self tapping valve. 250,125, 10-31-78, Cl. D23-40.000.
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Zimm-Zamm Aktiengesellschaft: *See*—
Baumgartner, Alfred, 250,134, Cl. D34-5.0ST.

CLASSIFICATION OF PATENTS

ISSUED OCTOBER 31, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

78 R 4,122,552
102 4,122,553
164 4,122,554
401 4,122,555

CLASS 3

13 4,122,556

CLASS 4

111.3 4,122,557
145 4,122,558
149 4,122,559
172 4,122,560
172.12 4,122,561
4,122,562
236 4,122,563
326 4,122,564

CLASS 5

90 4,122,565
260 4,122,566
345 R 4,122,567
4,122,568

CLASS 7

114 4,122,570
134 4,122,569

CLASS 8

39 A 4,123,222
42 D 4,123,223

CLASS 9

7 4,122,571

CLASS 10

105 4,122,572

CLASS 12

18.3 4,122,573
142 RS 4,122,574

CLASS 13

10 4,123,617

CLASS 15

49 R 4,122,576
104.06 R 4,122,575
160 4,122,577
250.23 4,122,578
353 4,122,579

CLASS 16

46 4,122,580
143 Re.29,816
158 4,122,581

CLASS 19

65 R 4,122,582

CLASS 23

232 R 4,123,227
314 4,123,226

CLASS 24

208 A 4,122,583
230 A 4,122,584
241 SB 4,122,585
277 4,122,586

CLASS 28

221 4,122,588

CLASS 29

148.4 C 4,122,589
157 C 4,122,590
157 R 4,122,591
404 4,122,592
407 4,122,593
408 4,122,594
424 4,122,595
527.2 4,122,596
568 4,122,597
4,122,598
758 4,122,599

CLASS 30

90 4,122,600
296 A 4,122,601
346.5 4,122,602
4,122,603
371 4,122,604

CLASS 32

10 A 4,122,605
11 4,122,606
15 Re.29,817

CLASS 33

174 L 4,122,607
4,122,608
174 P 4,122,609
186 4,122,610

CLASS 34

73 4,122,611
86 4,122,612

CLASS 35

9 A 4,122,613

CLASS 37

10 4,122,614

CLASS 38

93 4,122,615

CLASS 40

155 4,122,617
213 4,122,618
365 4,122,619
596 4,122,616

CLASS 42

1 L 4,122,621
1 LP 4,122,620
65 4,122,622
73 4,122,623

CLASS 43

42.33 4,122,624
82 4,122,625

CLASS 44

1 R 4,123,230
51 4,123,231
72 4,123,232

CLASS 46

11 4,122,626
92 4,122,627
135 R 4,122,628

CLASS 48

180 C 4,123,233

CLASS 49

357 4,122,629
386 4,122,630
394 4,122,631
470 4,122,632
501 4,122,633

CLASS 51

165.71 4,122,634
4,122,635
298 R 4,122,636

CLASS 52

3 4,122,637
70 4,122,638
90 4,122,639
248 4,122,640
403 4,122,641
511 4,122,642
520 4,122,643
648 4,122,645
4,122,646
695 4,122,647
749 4,122,648
787 4,122,644

CLASS 53

306 4,122,649
389 4,122,650
390 4,122,651

CLASS 55

5 4,123,234
85 4,123,235
197 4,123,236
205 4,123,237
226 4,123,238
379 4,123,239
385 C 4,123,240
442 4,123,241

CLASS 56

11.3 4,122,652

CLASS 57

34 R 4,122,653
54 4,122,654
58.89 4,122,655
58.91 4,122,656
81 4,122,657
140 R 4,122,658

CLASS 58

7 4,122,659
16.5 4,122,660
23 R 4,122,661
59 4,122,662
74 4,122,663
88 B 4,122,664
121 R 4,122,665

CLASS 59

80 4,122,666

CLASS 60

39.09 R 4,122,667
39.16 R 4,122,668
39.65 4,122,670
4,122,674
218 4,122,671
226 R 4,122,672
274 4,122,673
398 4,122,675
4,122,676
427 4,122,677
571 4,122,678
599 4,122,679
649 4,122,680

CLASS 62

54 4,122,684
80 4,122,685
81 4,122,686
156 4,122,687
196 R 4,122,688

CLASS 64

15 B 4,122,689

CLASS 65

11 W 4,123,242
16 4,123,243
60 C 4,123,244
104 4,123,245
4,123,246
141 4,123,247

CLASS 66

14 4,122,690

CLASS 68

5 E 4,122,691

CLASS 69

30 4,122,692

CLASS 70

56 4,122,693
406 4,122,694
417 4,122,695

CLASS 71

4 4,123,248
66 4,123,249
78 4,123,250
88 4,123,251
92 4,123,252
93 4,123,253
98 4,123,254
103 4,123,255
105 4,123,256

CLASS 72

52 4,122,696
128 4,122,697
286 4,122,698
325 4,122,699
342 4,122,700
354 4,122,701

CLASS 73

14 4,122,702
37.7 4,122,703
115 4,122,706
118 R 4,122,707
136 A 4,122,708
4,122,709
178 R 4,122,710
184 4,122,711
189 4,122,712
194 A 4,122,713
194 EM 4,122,714
228 4,122,715
231 R 4,122,716
4,122,717
304 C 4,122,718
342 4,122,719
346 4,122,720
354 4,122,721
362 AR 4,122,722
579 4,122,723
588 4,122,724
632 4,122,725
794 4,122,705
822 4,122,704

CLASS 74

21 4,122,726
56 4,122,727
103 4,122,728
128 4,122,729
606 R 4,122,730
674 4,122,731
863 4,122,732

CLASS 75

40 4,123,257
58 4,123,258
60 4,123,259
117 4,123,260
125 4,123,261
165 4,123,262
172 R 4,123,263
211 4,123,264
4,123,265
244 4,123,266

CLASS 81

9.3 4,122,733

CLASS 82

1 C 4,122,734
2.7 4,122,735

CLASS 83

23 4,122,736
268 4,122,737
314 4,122,738
421 4,122,739
646 4,122,740
834 4,122,741

CLASS 84

1.11 4,122,742
1.24 4,122,743
1.25 4,122,744
267 4,122,745
322 4,122,746
411 A 4,122,748
411 R 4,122,747
419 4,122,749
421 4,122,750
454 4,122,751

CLASS 85

30 4,122,752
74 4,122,753

CLASS 89

1.5 B 4,122,754

CLASS 90

11 A 4,122,755

CLASS 91

180 4,122,756
506 4,122,757

CLASS 92

23 4,122,758
168 4,122,759

CLASS 93

36 R 4,122,760

CLASS 96

1 PC 4,123,267
4,123,268
4,123,269
1 PS 4,123,283
1.5 R 4,123,270
1.8 4,123,271
29 D 4,123,330
35.1 4,123,272
66 T 4,123,273
4,123,274
77 4,123,275
85 4,123,277
87 R 4,123,278
91 D 4,123,279
91 R 4,123,276
94 BF 4,123,280
100 R 4,123,281
114.1 4,123,282

CLASS 98

33 R 4,122,761
40 D 4,122,762

CLASS 99

281 4,122,763
483 4,122,764
551 4,122,765
640 4,122,766

CLASS 100

35 4,122,767

CLASS 101

39 4,122,768
93.18 4,122,769
93.19 4,122,770
123 4,122,771
218 4,122,772
230 4,122,773
415.1 4,122,774

CLASS 102

8 4,122,775
214 4,122,776

CLASS 104

89 4,122,777
172 S 4,122,778

CLASS 105

199 R 4,122,779

CLASS 106

40 R 4,123,284
4,123,285
44 4,123,286
99 4,123,287
100 4,123,288

CLASS 108

25 4,122,780
101 4,122,781
111 4,122,782

CLASS 109

3 4,122,783

CLASS 111

4,122,784

CLASS 112

121.15 4,122,785
158 E 4,122,786
170 4,122,787
222 4,122,788
256 4,122,789

CLASS 113

120 R 4,122,790
121 C 4,122,791

CLASS 114

103 4,122,792
106 4,122,793
210 4,122,794

CLASS 116

63 R 4,122,795
132 R 4,122,796
137 A 4,122,797

CLASS 118

50 4,122,798
207 4,122,799
652 Re.29,818

CLASS 119

5 4,122,800

CLASS 122

20 B 4,122,801

CLASS 123

3 4,122,802
25 P 4,122,803
32 ST 4,122,804
4,122,805
103 R 4,122,806
117 A 4,122,808
117 R 4,122,807
119 A 4,122,810
4,122,812
119 EC 4,122,809
4,122,811
139 ST 4,122,813
148 DC 4,122,816
148 E 4,122,814
4,122,815
188 AA 4,122,817
196 AB 4,122,818
198 D 4,122,819
198 E 4,122,820
200 4,122,669

CLASS 124

23 R 4,122,821
54 4,122,822

CLASS 126

117 4,122,823
121 4,122,824
4,122,825
208 4,122,826
270 4,122,827
4,122,828
271 4,122,829
4,122,830
4,122,831
4,122,832
4,122,833
299 D 4,122,834
4,122,835

CLASS 128

1.1 4,122,836
2 S 4,122,837
4,122,838
4,122,840
2 Z 4,122,841
2.06 E 4,122,843
2.08 4,122,839
4,122,842
20 4,122,844
66 4,122,845
4,122,846
132 D 4,122,848
132 R 4,122,847
134 4,122,587
158 4,122,849
216 4,122,850
295 4,122,851
303 R 4,122,852
303.1 4,122,853
303.13 4,122,854
310 4,122,855
311 4,122,856
348 4,122,857
4,122,858

CLASS 131

84 B 4,122,859

CLASS 133

3 B 4,122,860

CLASS 134

109 4,122,861
134 4,123,289

CLASS 137

437 4,122,862
557 4,122,863
596.13 4,122,865
625.27 4,122,866
625.3 4,122,867
625.6 4,122,864
625.69 4,122,868

CLASS 138

93 4,122,869
109 4,122,870

CLASS 139

11 4,122,871
4,122,872
110 4,122,873

CLASS 140

147 4,122,874

CLASS 141

11 4,122,875
150 4,122,876

CLASS 144

208 E 4,122,877
316 4,122,878

CLASS 148

6.2 4,123,290
6.35 4,123,291
4,123,292
11.5 C 4,123,293
13.1 4,123,294
33 4,123,295
36 4,123,296
103 4,123,297
111 4,123,298
4,123,299
153 4,123,301
171 4,123,302
187 4,123,300

CLASS 149

17 4,123,303

CLASS 152

209 R 4,122,879
216 4,122,880
4,122,881
381.2 WC 4,122,882

CLASS 156

48 4,123,304
71 4,123,305
96 4,123,306
172 4,123,307
234 4,123,309
272 4,123,308
351 4,123,310
443 4,123,311
466 4,123,312
498 4,123,313
505 4,123,314
560 4,123,315
630 Re.29,820
643 4,123,316

CLASS 157

1.17 4,122,883

CLASS 160

168 R 4,122,884
176 R 4,122,885
269 4,122,886
354 4,122,887

CLASS 162

17 4,123,317
19 4,123,318
158 4,123,319
199 4,123,320
272 4,123,321
352 4,123,322

CLASS 164

82 4,122,888
87 4,122,889
444 4,122,890

CLASS 165

9 4,122,891
12 4,122,892
16 4,122,893
76 4,122,894

CLASS 166

250 4,122,896
252 4,122,895
256 4,122,897
297 4,122,899
325 4,122,898

CLASS 168

12 4,122,900

CLASS 171

61 4,122,901

CLASS 172

41 4,122,902
781 4,122,903

CLASS 173

15 4,122,904

CLASS 174

11 BH 4,123,618
19 4,123,619

CLASS 175

396 4,122,905

CLASS 176

30 4,123,323
37 4,123,324
38 4,123,325
68 4,123,326
76 4,123,327
78 4,123,328

CLASS 177

213 4,122,906

CLASS 179

1 CN 4,123,620
1 E 4,123,621
1 UW 4,123,622
6.3 R 4,123,623
15 AT 4,123,624
16 EA 4,123,625
170.2 4,123,626

CLASS 180

33 C 4,122,907
68 P 4,122,908
127 4,122,909

CLASS 181

144 4,122,910
199 4,122,911
218 4,122,912
256 4,122,913
258 4,122,914
284 4,122,915

CLASS 182

82 4,122,916
144 4,122,917
181 4,122,918

CLASS 187

29 R 4,122,919

CLASS 188

73.4 4,122,920
79.5 GE 4,122,921
267 4,122,922
285 4,122,923

CLASS 190

18 A 4,122,924
52 4,122,925

CLASS 192

18 A 4,122,926
48.8 4,122,927
56 R 4,122,928
70.18 4,122,929
84 C 4,122,930
106.2 4,122,931

CLASS 193

5 4,122,932
32 4,122,933
4,122,934

CLASS 194

4,122,935

CLASS 195

28 R 4,123,329

CLASS 198

339 4,122,936
408 4,122,937
411 4,122,938
482 4,122,939
504 4,122,940
774 4,122,941

CLASS 200

5 A 4,123,627
38 FB 4,123,628
51 R 4,123,629
52 R 4,123,630
4,123,631
61.27 4,123,632
61.86 4,123,633
67 A 4,123,634
148 A 4,123,636
4,123,637
148 F 4,123,635
153 G 4,123,638
254 4,123,639
296 4,123,640
340 4,123,641

CLASS 201

4 4,123,331
15 4,123,332

CLASS 202

255 4,123,333
262 4,123,334

CLASS 204

1 T 4,123,335
98 4,123,336
129.3 4,123,337
147 4,123,338
149 4,123,339
4,123,340
152 4,123,341
180 G 4,123,343
180 P 4,123,342
195 S 4,123,344
275 4,123,345
299 R 4,123,346

CLASS 206

5.1 4,122,942
221 4,122,943
303 4,122,949
349 4,122,944
395 4,122,945
523 4,122,946
569 4,122,947
622 4,122,948

CLASS 208

8 4,123,347
10 4,123,348
4,123,349
108 4,123,350
262 4,123,351

CLASS 209

12 4,122,950
545 4,122,951
546 4,123,352
551 4,122,953
579 4,122,952

CLASS 210

22 C 4,123,353
40 4,123,354
50 4,123,355
67 4,123,356
71 4,123,357
104 4,123,358
169 4,123,359
216 4,123,360
232 4,123,361
4,123,362
331 4,123,363
512 M 4,123,364
521 4,123,365

CLASS 211

126 4,122,955
131 4,122,956
133 4,122,954

CLASS 214

16.4 A 4,122,957
38 CC 4,122,958
140 4,122,960
313 4,122,961
394 4,122,962
512 4,122,963

CLASS 215

260 4,122,964
344 4,122,965

CLASS 219

10.55 R 4,123,643
10.57 4,123,644
10.59 4,123,642
69 W 4,123,645
137 R 4,123,646
216 4,123,647
521 4,123,648

CLASS 220

1.5 4,122,966
2.3 R 4,122,967
86 R 4,122,968
256 4,122,969
4,122,970
268 4,122,971
331 4,122,972
404 4,122,973

CLASS 221

13 4,122,974
173 4,122,975

CLASS 222

94 4,122,976
182 4,122,977
189 4,122,978
193 4,122,979
207 4,122,980
231 4,122,981
321 4,122,982
390 4,122,983

CLASS 224

2 D 4,122,984

CLASS 226

181 4,122,985
198 4,122,986

CLASS 227

10 4,122,987
53 4,122,988
67 Re.29,819
108 4,122,989

CLASS 228

2 4,122,990
13 4,122,991
176 4,122,992

CLASS 229

62.5 4,122,993

CLASS 235

89 R 4,122,994
92 PD 4,123,649
302 4,122,995
302.3 4,122,996
455 4,122,997
475 4,122,998

CLASS 236

11 4,122,999
4,123,000
49 4,123,001

CLASS 237

1 A 4,123,002
4,123,003

CLASS 239

266 4,123,006
310 4,123,004
327 4,123,005
414 4,123,007
568 4,123,008

CLASS 241

30 4,123,009

CLASS 242

68.3 4,123,010
78.1 4,123,011
85.1 4,123,012
107 4,123,013
152.1 4,123,014
191 4,123,015
201 4,123,016

CLASS 244

3.16 4,123,017
3.2 4,123,019
17.23 4,123,018
116 4,123,020
155 R 4,123,021

CLASS 245

10 4,123,022

CLASS 246

182 B 4,123,023

CLASS 248

214 4,123,024
303 4,123,025
316 E 4,123,026
327 4,123,027
425 4,123,028
453 4,123,029
478 4,123,030

CLASS 249

24 4,123,031
29 4,123,032
65 4,123,033
156 4,123,034

CLASS 250

201 4,123,650
203 R 4,123,651
204 4,123,652
231 SE 4,123,653
272 4,123,654
305 4,123,655
381 4,123,656
385 4,123,657
390 4,123,658
403 4,123,659
491 4,123,660
492 A 4,123,661
518 4,123,662
531 4,123,663
536 4,123,664
565 4,123,665

CLASS 251

146 4,123,035
180 4,123,036
367 4,123,037

CLASS 252

8.5 A 4,123,366
8.5 B 4,123,367
25 4,123,368
32.7 E 4,123,369
4,123,370
42.7 4,123,371
48.2 4,123,372
48.6 4,123,373
62.1 L 4,123,374
99 4,123,375
4,123,376
103 4,123,377
171 4,123,378
184 4,123,379
301.1 W 4,123,380
316 4,123,381
4,123,382
321 4,123,383
408 4,123,384
414 4,123,385
429 B 4,123,386
4,123,387
437 4,123,388
441 4,123,389
455 Z 4,123,390
466 PT 4,123,391
478 4,123,392
522 4,123,393
4,123,394
559 4,123,395

CLASS 254

2 R 4,123,038
9 C 4,123,039
166 4,123,040
195 4,123,041

CLASS 260

17.4 CL 4,123,398
17.4 GC 4,123,397
22 D 4,123,454
23 XA 4,123,399
4,123,400
23.7 M Re.29,821
29.1 SB 4,123,409
29.2 EP 4,123,402
4,123,403
29.4 R 4,123,404
29.6 AN 4,123,406
29.6 F 4,123,401
29.6 R 4,123,405
29.6 TA 4,123,407
4,123,408
30.6 R 4,123,410
30.8 DS 4,123,412
30.8 R 4,123,411
4,123,436
32.6 NR 4,123,413
38 4,123,414
40 R 4,123,415
42.18 4,123,416
42.46 4,123,417
45.8 NT 4,123,418
45.8 NZ 4,123,419
112 B 4,123,427
112 R 4,123,426
112.5 S 4,123,425
145 C 4,123,428
147 4,123,429
243.3 4,123,430
292 4,123,431
293.69 4,123,432
294.9 4,123,433
296 D 4,123,434
307 D 4,123,435
308 R 4,123,437
326.28 4,123,440
326.5 B 4,123,439
326.5 FN 4,123,438
345.2 4,123,441
346.75 4,123,442
347.4 4,123,443
347.8 4,123,444
348.12 4,123,445
439 R 4,123,446
4,123,447
449 M 4,123,448
453 AR 4,123,449
453 P 4,123,450
465 D 4,123,451
465 E 4,123,452
465.3 4,123,453
507 R 4,123,455
544 D 4,123,460
558 A 4,123,461
595 B 4,123,462
580 R 4,123,463
601 R 4,123,464
606.5 P 4,123,465
645 4,123,466
659 A 4,123,467
668 A 4,123,468
668 D 4,123,470
668 F 4,123,469
683.15 C 4,123,471
827 4,123,472
860 4,123,473
874 4,123,474
4,123,475
897 A 4,123,476
897 C 4,123,477
986 4,123,478

CLASS 261

44 B 4,123,479
52 4,123,480
81 4,123,481
91 4,123,482

CLASS 264

0.5 4,123,484
1 4,123,483
33 4,123,485
46.6 4,123,486
90 4,123,487
135 4,123,488
141 4,123,489
147 4,123,490
167 4,123,491
210 F 4,123,492
244 4,123,493
258 4,123,494
318 4,123,495
329 4,123,496

CLASS 266

44 4,123,042
158 4,123,043
255 4,123,044
275 4,123,045

CLASS 269

228 4,123,046
238 4,123,047

CLASS 270

77 4,123,048

CLASS 271

225 4,123,049

CLASS 272

8 N 4,123,052

CLASS 273

1 E 4,123,050
1 R 4,123,051
26 R 4,123,053
73 F 4,123,054
77 A 4,123,055
78 4,123,056
82 R 4,123,057
87 H 4,123,058
101 4,123,059
167 R 4,123,060
220 4,123,061
248 4,123,062

CLASS 274

1 R 4,123,063
4,123,064
9 B 4,123,065
10 C 4,123,066
37 4,123,067

CLASS 277

27 4,123,068
70 4,123,069
135 4,123,070
205 4,123,071
216 4,123,072
229 4,123,073

CLASS 279

19.5 4,123,074
121 4,123,075

CLASS 280

11.27 4,123,076
47.34 4,123,077
87.02 W 4,123,078
87.04 A 4,123,080
220 4,123,079
463 4,123,081
467 4,123,082
605 4,123,083
630 4,123,084
752 4,123,085

CLASS 282

11.5 A 4,123,086

CLASS 283

1 R 4,123,087

CLASS 285

14 4,123,088
39 4,123,089
4,123,090
4,123,091
187 4,123,092
189 4,123,093
405 4,123,094
409 4,123,095

CLASS 290

52 4,123,666
53 4,123,667

CLASS 292

216 4,123,096
336.3 4,123,097

CLASS 294

1 CA 4,123,098

CLASS 296

10 4,123,099

93 4,123,100

CLASS 297

58 4,123,101
270 4,123,102
305 4,123,103
391 4,123,104
451 4,123,105

CLASS 299

6 4,123,107
16 4,123,108
18 4,123,109
43 4,123,110

CLASS 301

35 BJ 4,123,112
37 TP 4,123,111

CLASS 302

2 R 4,123,113
53 4,123,114

CLASS 303

22 R 4,123,115
103 4,123,116
114 4,123,117
119 4,123,118

CLASS 305

39 4,123,119
41 4,123,120

CLASS 307

10 LS 4,123,668
205 4,123,669
254 4,123,670
270 4,123,671
303 4,123,672
326 4,123,673
351 4,123,674

CLASS 308

6 C 4,123,121
238 4,123,122

CLASS 310

49 R 4,123,675
52 4,123,676
4,123,677
217 4,123,678
266 4,123,679
320 4,123,680
322 4,123,681

CLASS 312

1 4,123,123
21 4,123,124
35 4,123,125
201 4,123,126
230 4,123,127
244 4,123,128
257 R 4,123,129
285 4,123,130

CLASS 313

54 4,123,682
156 4,123,683
205 4,123,684
218 4,123,685
230 4,123,686
484 4,123,687

CLASS 314

138 R 4,122,959

CLASS 315

58 4,123,688
209 R 4,123,689
258 4,123,690

CLASS 318

119 4,123,691
227 4,123,692
376 4,123,693
443 4,123,694
561 4,123,695
623 4,123,696

CLASS 322

2 A 4,123,697

CLASS 323

1 4,123,698

CLASS 324

29 4,123,700
30 B 4,123,701
58.5 A 4,123,702
58.5 B 4,123,703
78 Z 4,123,704
121 R 4,123,705
158 P 4,123,706
208 4,123,707
224 4,123,708

CLASS 325

38 A 4,123,710
38 B 4,123,709
62 4,123,711
137 4,123,712
455 4,123,713
4,123,714
464 4,123,715
4,123,716
470 4,123,717
474 4,123,718

CLASS 328

155 4,123,719
234 4,123,720

CLASS 330

69 4,123,721
85 4,123,722
311 4,123,723

CLASS 331

1 A 4,123,724
8 4,123,725
14 4,123,726
94 4,123,727
94.5 L 4,123,728
181 4,123,729

CLASS 333

26 4,123,730
30 R 4,123,731
70 R 4,123,732
70 T 4,123,733

CLASS 335

9 4,123,734

CLASS 336

30 4,123,735
120 4,123,736
239 4,123,177

CLASS 337

68 4,123,737
159 4,123,738
301 4,123,739

CLASS 338

67 4,123,740
121 4,123,741
137 4,123,742
322 4,123,743

CLASS 339

117 R 4,123,131
246 4,123,132
273 R 4,123,133

CLASS 340

15.5 TN 4,123,744
63 4,123,745
81 R 4,123,746
149 A 4,123,747
324 M 4,123,751
347 P 4,123,750
545 4,123,752
558 4,123,748
572 4,123,749
621 4,123,753

CLASS 343

17.1 R 4,123,755
615 SS 4,123,754
702 4,123,756
766 4,123,757
830 4,123,758
854 4,123,759

CLASS 346

75 4,123,760
140 R 4,123,761
155 4,123,762

CLASS 350

6.7 4,123,134
6.8 4,123,135
16 4,123,136
96.21 4,123,137
4,123,138
4,123,139
105 4,123,140
159 4,123,141
162 SF 4,123,142
171 4,123,143
222 4,123,144
269 4,123,145
285 4,123,146
4,123,147
293 4,123,148
294 4,123,149
4,123,150
301 4,123,151

CLASS 352

69 4,123,152
191 4,123,153

CLASS 353

26 R 4,123,699

CLASS 354

4 4,123,763
24 4,123,764
25 4,123,765
51 4,123,766
107 4,123,767
292 4,123,768
322 4,123,769
337 4,123,770

CLASS 355

3 SC 4,123,156
15 4,123,154
26 4,123,155
43 4,123,157

CLASS 356

32 4,123,158
38 4,123,159
75 4,123,160
99 4,123,161
106 LR 4,123,162
124 4,123,163
152 4,123,164
4,123,165
4,123,166
4,123,167
4,123,168
167 4,123,169
4,123,170
175 4,123,171
188 4,123,172
246 4,123,173

CLASS 357

23 4,123,771
27 4,123,772

CLASS 358

4 4,123,773
4,123,774
10 4,123,775
4,123,776
55 4,123,777
107 4,123,778
128 4,123,779
4,123,780
191 4,123,781
210 4,123,782
230 4,123,783

CLASS 360

6 4,123,785
35 4,123,786
74 4,123,787
77 4,123,788
96 4,123,789
100 4,123,784
111 4,123,790
130 4,123,791

CLASS 361

30 4,123,792

CLASS 362

350 4,123,793

CLASS 364

101 4,123,794
200 4,123,795
900 4,123,796

CLASS 365

118 4,123,797
205 4,123,799
237 4,123,798

CLASS 366

102 4,123,174
150 4,123,800
151 4,123,175
166 4,123,176
292 4,123,801
338 4,123,178

CLASS 400

328 4,123,182

CLASS 401

6 4,123,179

CLASS 403

172 4,123,180

CLASS 404

9 4,123,181
10 4,123,183
25 4,123,184

CLASS 405

76 4,123,185
142 4,122,683
150 4,122,682
261 4,122,681

CLASS 407

54 4,123,186

CLASS 408

17 4,123,187
4,123,188
21 4,123,189
25 4,123,190
42 4,123,191
133 4,123,192
202 4,123,193
221 4,123,194
241 R 4,123,195

CLASS 415

123 4,123,197
181 4,123,196

CLASS 416

243 4,123,198
244 A 4,123,199

CLASS 417

64 4,123,200
204 4,123,201
216 4,123,202
252 4,123,203
393 4,123,204

CLASS 418

127 4,123,205

CLASS 422

59 4,123,224
98 4,123,225
199 4,123,229
274 4,123,228

CLASS 423

2 4,123,497
4,123,498
35 4,123,499
4,123,500
152 4,123,501
230 4,123,502
300 4,123,503
446 4,123,504
564 4,123,505
566 4,123,506
573 G 4,123,507
580 4,123,508

CLASS 424

12 4,123,509
4,123,510
46 4,123,511
54 4,123,512
4,123,513
4,123,514
4,123,515
4,123,516
57 4,123,517
78 4,123,518
88 4,123,519
92 4,123,520
116 4,123,522
121 4,123,521
177 4,123,523
180 4,123,524
200 4,123,525
4,123,526
244 4,123,527
248.52 4,123,528
250 4,123,529
4,123,530
4,123,531
251 4,123,532
4,123,533
253 4,123,534
256 4,123,535
258 4,123,536
263 4,123,537
267 4,123,538
270 4,123,539
272 4,123,540
4,123,541
273 R 4,123,542
274 4,123,543
4,123,544
4,123,545
4,123,546
4,123,547
4,123,548
4,123,549
275 4,123,550
279 4,123,551
311 4,123,552
4,123,553
324 4,123,554
330 4,123,555
341 4,123,556

CLASS 425

5 4,123,206
67 4,123,207
72 S 4,123,208
74 4,123,209
78 4,123,210
82.1 4,123,211
4,123,212
104 4,123,213
129 R 4,123,214
388 4,123,215
431 4,123,216
525 4,123,217
535 4,123,218

CLASS 426

105 4,123,557
268 4,123,558
312 4,123,559
509 4,123,560
600 4,123,561

CLASS 427

58 4,123,562
68 4,123,563
85 4,123,564
88 4,123,565
115 4,123,566
123 4,123,567
126 4,123,568
141 4,123,569
222 4,123,570
249 4,123,571
272 4,123,572
324 4,123,573
341 4,123,574
386 4,123,575

CLASS 428

35 4,123,576
95 4,123,577
206 4,123,578
264 4,123,579
304 4,123,580
318 4,123,581
335 4,123,582
336 4,123,583
379 4,123,584
4,123,585
391 4,123,586
407 4,123,587
412 4,123,588
425 4,123,589
450 4,123,590
454 4,123,591
532 4,123,592
535 4,123,593
651 4,123,594
667 4,123,595

CLASS 429

104 4,123,596
112 4,123,597
159 4,123,598

CLASS 431

353 4,123,220

CLASS 432

1 4,123,219
152 4,123,221

CLASS 521

123 4,123,599

CLASS 526

24 4,123,396
65 4,123,600
79 4,123,601
206 4,123,602
254 4,123,603

CLASS 528

31 4,123,604
60 4,123,605
65 4,123,421
71 4,123,423
127 4,123,420
273 4,123,422
337 4,123,424
499 4,123,606

CLASS 536

17 4,123,607
4,123,608
27 4,123,609
28 4,123,610

CLASS 542

421 4,123,611

CLASS 544

16 4,123,612
408 4,123,613

CLASS 560

254 4,123,614

CLASS 562

466 4,123,457
503 4,123,456
595 4,123,458
4,123,459

CLASS 568

712 4,123,615
861 4,123,616

CLASSIFICATION OF DESIGNS

D2—	208	250,066	D7—	105	250,080	1-1—	60	250,109		143	250,106	D16—	06	250,120	D30—	35	250,139
	232	250,067		136	250,081	D10—	64	250,094		146	250,107			250,121		37	250,138
D4—	08	250,068		152	250,082			250,095	D13—	17	250,110	D19—	77	250,122	D33—	9 C	250,140
	35	250,069	D8—	10	250,083			250,096	D14—	53	250,111	D23—	2	250,123	D34—	5 GH	250,136
D6—	25	250,070		68	250,084		65	250,097		60	250,108		4	250,124		5 K	250,135
	48	250,071		72	250,085		83	250,098		86	250,112		40	250,125		5 SS	250,133
	56	250,072		91	250,086		121	250,099	D15—	9	250,113		51	250,126		5 ST	250,134
		250,074		346	250,087	D11—	90	250,100		30	250,114		97	250,127		15 C	250,137
	66	250,073		355	250,088		119	250,101		52	250,115	D24—	21	250,128	D48—	24 A	250,141
	67	250,075		396	250,089		164	250,102		69	250,116		56	250,129		38	250,142
	90	250,076	D9—	168	250,090	D12—	60	250,103		90	250,117	D28—	8	250,131	D52—	2 A	250,143
	116	250,077		179	250,091			250,104		123	250,118		46	250,130	D64—	11 R	250,144
	172	250,078		192	250,092		112	250,105		138	250,119		64	250,132	D73—	1 R	250,145
	178	250,079		245	250,093												

CLASSIFICATION OF PLANTS

P.—	47	4,329		74	4,326			4,328		75	4,327						

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 : 4,122,991
4,123,165
2 : 4,123,061
4 : 4,123,799
5 : 4,122,984
4,123,034
6 : 4,122,638
4,122,640
4,122,663
4,122,725
4,122,726
4,122,742
4,122,746
4,122,754
4,122,862
4,122,874
4,122,947
4,123,007
4,123,102
4,123,134
4,123,135
4,123,138
4,123,184
4,123,255
4,123,431
4,123,435
4,123,467
4,123,495
4,123,507
4,123,550
4,123,622
4,123,773
4,123,774
4,123,790
8 : 4,123,598
9 : 4,122,943
4,122,992
4,123,122
4,123,149
4,123,175
4,123,284
4,123,586
01 : 4,122,737
4,122,877
4,122,945
4,123,168
4,123,727
04 : 4,122,647
4,122,827
4,123,098
4,123,680
4,123,715
06 : 4,122,552
4,122,553
4,122,564
4,122,569
4,122,590
4,122,592
4,122,604
4,122,631
4,122,666
4,122,671
4,122,699
4,122,751
4,122,759
4,122,771
4,122,796
4,122,803
4,122,810
4,122,815
4,122,816
4,122,828
4,122,833
4,122,847
4,122,853
4,122,875
4,122,901
4,122,912
4,122,950
4,122,964
4,122,980
4,122,988
4,122,995
4,123,003
4,123,020
4,123,029
4,123,035
4,123,047
4,123,060
4,123,080
4,123,095
4,123,097
4,123,162
4,123,183
4,123,204
4,123,229
4,123,232
4,123,251
4,123,295
4,123,310
4,123,396
4,123,404
4,123,409
4,123,442
4,123,498
4,123,526
4,123,542
4,123,605
4,123,614
4,123,623
4,123,661
4,123,683
4,123,689
4,123,697
4,123,703
4,123,706
4,123,728
4,123,785
4,123,789
4,123,791
4,123,800
08 : 4,122,585
4,122,870
4,122,937
4,123,093
4,123,155
4,123,270
4,123,591
4,123,610
4,123,722
09 : Re.29,820
4,122,574
4,122,622
4,122,788
4,123,212
4,123,466
4,123,737
4,123,739
10 : 4,122,711
4,123,379
4,123,546
4,123,603
11 : 4,123,355
12 : 4,122,618
4,122,752
4,122,776
4,122,799
4,122,829
4,122,844
4,122,869
4,122,917
4,122,944
4,122,998
4,123,017
4,123,019
4,123,024
4,123,033
4,123,053
4,123,150
13 : 4,122,567
4,122,639
4,122,648
4,122,889
4,123,082
4,123,092
4,123,213
4,123,584
17 : 4,122,606
4,122,607
4,122,609
4,122,613
4,122,633
4,122,644
4,122,675
4,122,720
4,122,733
4,122,749
4,122,758
4,122,780
4,122,820
4,122,821
4,122,851
4,122,856
4,122,867
4,122,868
4,122,876
4,122,893
4,122,903
4,122,908
4,122,926
4,122,932
4,122,936
4,122,959
4,122,961
4,122,974
4,123,028
4,123,055
4,123,089
4,123,090
4,123,119
4,123,158
4,123,179
4,123,181
4,123,201
4,123,203
4,123,209
4,123,234
4,123,249
4,123,268
4,123,335
4,123,359
4,123,361
4,123,430
4,123,468
4,123,488
4,123,489
4,123,581
4,123,597
4,123,639
4,123,646
4,123,674
4,123,745
4,123,796
4,123,797
18 : 4,122,646
4,122,668
4,122,670
4,122,736
4,122,750
4,122,890
4,122,911
4,123,010
4,123,072
4,123,105
4,123,266
4,123,294
4,123,301
4,123,402
4,123,413
4,123,415
4,123,612
4,123,716
4,123,729
4,123,775
4,123,776
19 : 4,122,704
4,122,966
4,123,552
20 : 4,122,731
4,123,038
21 : 4,122,695
4,122,739
4,122,779
4,122,983
4,123,027
22 : 4,123,107
4,123,125
4,123,320
4,123,350
23 : 4,123,306
24 : 4,122,793
4,122,834
4,122,845
4,122,900
4,123,230
4,123,499
4,123,585
4,123,710
4,123,719
4,123,757
25 : Re.29,819
4,122,573
4,122,600
4,122,602
4,122,603
4,122,617
4,122,721
4,122,782
4,122,794
4,122,830
4,122,887
4,122,904
4,122,942
4,122,973
4,122,978
4,123,002
4,123,063
4,123,126
4,123,141
4,123,160
4,123,163
4,123,177
4,123,192
4,123,236
4,123,267
4,123,289
4,123,567
4,123,583
4,123,588
4,123,619
4,123,630
4,123,651
4,123,696
4,123,698
4,123,700
4,123,750
4,123,759
4,123,798
26 : 4,122,563
4,122,580
4,122,586
4,122,596
4,122,629
4,122,637
4,122,641
4,122,687
4,122,705
4,122,732

4,122,755
4,122,760
4,122,766
4,122,804
4,122,805
4,122,808
4,122,811
4,122,866
4,122,923
4,122,928
4,122,948
4,122,955
4,123,004
4,123,023
4,123,052
4,123,068
4,123,075
4,123,079
4,123,099
4,123,113
4,123,157
4,123,186
4,123,187
4,123,188
4,123,195
4,123,297
4,123,311
4,123,322
4,123,345
4,123,403
4,123,441
4,123,463
4,123,472
4,123,521
4,123,536
4,123,604
4,123,609
4,123,621
4,123,640
4,123,660
4,123,678
4,123,746
27 : 4,122,627
4,122,649
4,122,713
4,122,824
4,122,848
4,122,972
4,122,985
4,123,081
4,123,091
4,123,142
4,123,282
4,123,309
4,123,314
4,123,397
4,123,491
4,123,578
4,123,580
4,123,649
28 : 4,123,140
29 : 4,122,566
4,122,571
4,122,693
4,122,842
4,123,231
4,123,519
4,123,657
30 : 4,122,767
31 : 4,123,717
32 : 4,122,579
4,122,623
4,122,650

33 : 4,122,614
4,123,675
34 : Re.29,821
4,122,619
4,122,729
4,122,800
4,122,871
4,122,872
4,122,954
4,122,971
4,122,976
4,122,979
4,123,057
4,123,133
4,123,137
4,123,139
4,123,164
4,123,173
4,123,233
4,123,237
4,123,272
4,123,302
4,123,307
4,123,308
4,123,328
4,123,372
4,123,373
4,123,376
4,123,382
4,123,383
4,123,389
4,123,393
4,123,398
4,123,417
4,123,421
4,123,433
4,123,446
4,123,456
4,123,457
4,123,458
4,123,459
4,123,464
4,123,465
4,123,469
4,123,512
4,123,513
4,123,514
4,123,515
4,123,516
4,123,520
4,123,522
4,123,528
4,123,539
4,123,547
4,123,553
4,123,562
4,123,668
4,123,685
4,123,713
4,123,743
4,123,752
4,123,755
35 : 4,122,678
4,122,899
36 : Re.29,818
4,122,556
4,122,562
4,122,577
4,122,594
4,122,598
4,122,660
4,122,703

4,122,718
4,122,727
4,122,764
4,122,801
4,122,841
4,122,849
4,122,850
4,122,855
4,122,878
4,122,891
4,122,906
4,122,924
4,122,957
4,122,996
4,123,001
4,123,012
4,123,016
4,123,022
4,123,049
4,123,051
4,123,059
4,123,062
4,123,087
4,123,101
4,123,127
4,123,136
4,123,152
4,123,153
4,123,154
4,123,178
4,123,262
4,123,269
4,123,273
4,123,274
4,123,283
4,123,286
4,123,299
4,123,318
4,123,339
4,123,390
4,123,392
4,123,407
4,123,408
4,123,410
4,123,436
4,123,440
4,123,444
4,123,455
4,123,474
4,123,475
4,123,485
4,123,506
4,123,557
4,123,566
4,123,569
4,123,573
4,123,574
4,123,607
4,123,608
4,123,667
4,123,669
4,123,677
4,123,701
4,123,725
4,123,747
4,123,753
4,123,754
37 : 4,122,555
4,122,628
4,123,221
4,123,490
4,123,555
4,123,628

38 : 4,122,960
39 : 4,122,558
4,122,576
4,122,597
4,122,612
4,122,677
4,122,700
4,122,728
4,122,744
4,122,791
4,122,817
4,122,857
4,122,865
4,122,886
4,122,930
4,122,968
4,122,986
4,123,100
4,123,131
4,123,172
4,123,189
4,123,194
4,123,196
4,123,210
4,123,218
4,123,240
4,123,263
4,123,290
4,123,291
4,123,292
4,123,298
4,123,337
4,123,344
4,123,370
4,123,377
4,123,395
4,123,411
4,123,427
4,123,453
4,123,503
4,123,582
4,123,594
4,123,595
4,123,631
4,123,642
4,123,643
4,123,644
4,123,662
4,123,673
4,123,708
4,123,740
4,123,760
4,123,792
40 : 4,122,595
4,122,621
4,122,717
4,122,895
4,122,909
4,123,005
4,123,025
4,123,226
4,123,351
4,123,366
4,123,369
4,123,447
4,123,470
4,123,627
41 : 4,122,557
4,122,626
4,122,819
4,122,958
4,123,040

4,123,129
4,123,315
4,123,332
4,123,486
4,123,637
4,123,705
42 : Re.29,817
4,122,593
4,122,610
4,122,651
4,122,654
4,122,685
4,122,734
4,122,792
4,122,843
4,122,860
4,122,885
4,122,927
4,122,949
4,122,965
4,122,999
4,123,036
4,123,039
4,123,042
4,123,161
4,123,223
4,123,245
4,123,246
4,123,250
4,123,252
4,123,334
4,123,368
4,123,422
4,123,425
4,123,432
4,123,445
4,123,448
4,123,450
4,123,473
4,123,532
4,123,537
4,123,538
4,123,617
4,123,618
4,123,635
4,123,636
4,123,676
4,123,693
4,123,734
4,123,767
44 : 4,122,653
4,123,304
45 : 4,122,560
4,122,588
4,122,616
4,122,655
4,122,790
4,123,014
4,123,560
4,123,579
47 : 4,122,719
4,122,858
4,123,031
4,123,206
4,123,633
48 : 4,122,554
4,122,570
4,122,709
4,122,716
4,122,748
4,122,762
4,122,772

49 : 4,123,070
4,123,524
4,123,704
50 : 4,122,708
4,122,918
4,123,300
51 : 4,122,712
4,122,781
4,122,994
4,123,116
4,123,338
4,123,358
4,123,592
53 : 4,122,561
4,122,565
4,122,582
4,122,674
4,122,722
4,122,724
4,122,825
4,122,836
4,122,916
4,123,128
4,123,148
4,123,185
4,123,193
4,123,505
4,123,561
4,123,648
4,123,681
4,123,732
54 : 4,122,681
4,122,897
4,123,021
4,123,207
4,123,419
4,123,462
4,123,606
55 : 4,122,652
4,122,884
4,123,000
4,123,342
4,123,362
4,123,634
4,123,692
4,123,699
4,123,738
56 : 4,123,182

DESIGN PATENTS

6 : 250,125
8 : 250,135
9 : 250,071
06 : 250,072
250,078
250,086
250,088
250,098
250,129
250,131

250,133
250,139
09 : 250,083
250,144
12 : 250,122
17 : 250,073
250,074
250,075
250,080
250,091

250,092
250,093
250,097
250,105
18 : 250,112
250,138
20 : 250,067
250,141
24 : 250,143
25 : 250,103

250,104
250,106
250,118
26 : 250,081
27 : 250,127
29 : 250,099
33 : 250,136
34 : 250,087
250,090
250,108

250,109
250,110
250,116
36 : 250,066
250,070
250,100
250,126
250,137
250,145
37 : 250,095

250,096
38 : 250,140
39 : 250,068
250,084
250,102
42 : 250,076
48 : 250,119
250,124
49 : 250,085
51 : 250,077

PLANT PATENTS

06 : 4,329
27 : 4,327

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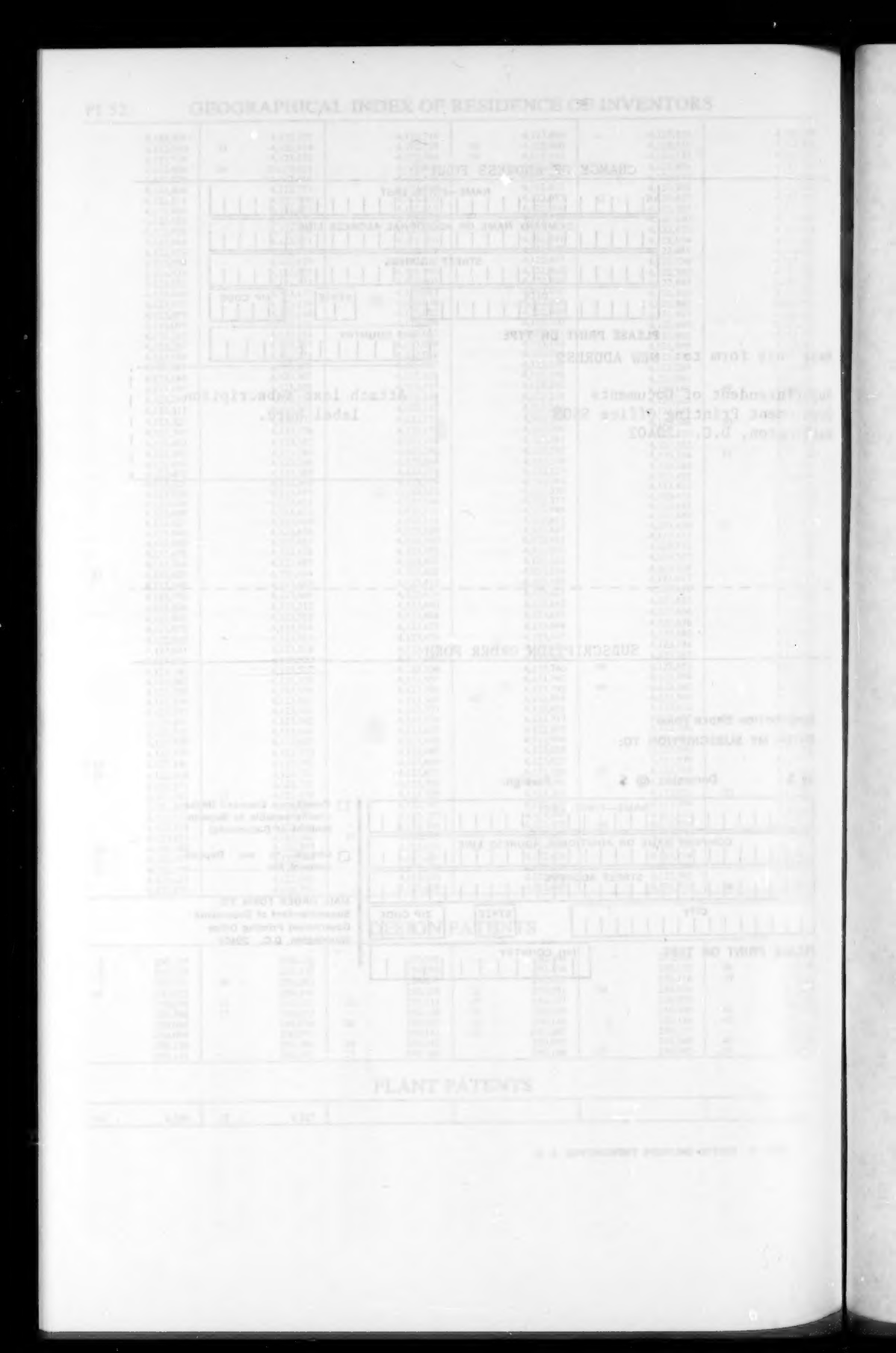

FOREIGN PATENTS

PLANT PATENTS

U.S. DEPARTMENT OF COMMERCE
Juanita M. Kreps
PATENT AND TRADEMARK OFFICE
Donald W. Banner